

ENCYCLOPEDIA OF EDUCATION AND HUMAN DEVELOPMENT

STEPHEN J. FARENGA
AND DANIEL NESS
EDITORS



ENCYCLOPEDIA OF EDUCATION AND HUMAN DEVELOPMENT

VOLUME ONE

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**STEPHEN J. FARENGA
AND DANIEL NESS
EDITORS**

VOLUME ONE

FOREWORD BY JAMES H. BORLAND

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Dedicated to our students

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FOREWORD

The publication of the *Encyclopedia of Education and Human Development* is a significant event in the field of education, and a most impressive one as well. Its significance derives from the fact that gathered between these covers is probably the most comprehensive compendium of writings about education, and the disciplines on which it depends, ever assembled. The sheer volume of information, ideas, theories, practices, and so forth is not only staggering but of obvious and indisputable utility. This volume may not contain everything one needs to know about education at this time and in this place, but it comes closer to anything of which I am aware, or, frankly, anything I can imagine. The old cliché to the effect that “this book belongs on the bookshelf of anyone seriously interested in [insert subject here]” is clearly true when one inserts “American education in the early twenty-first century” in the brackets.

As to what makes the *Encyclopedia of Education and Human Development* impressive, there is, first, the comprehensiveness mentioned above. To attempt not only to identify what the editors refer to as “the complete list,” an exhaustive array of topics covering everything that is important in education and human development, but also actually to compile a book containing chapters dealing with each of those topics would seem to be hubristic—except for the fact that Stephen J. Farenga and Daniel Ness have managed to do it. What a post-postmodern thing to do! Ambition on this level is rare these days, and, seeing something done on this scale makes clear what we have lost by lowering our expectations and meekly staying within the bounds of the practical, or even the practicable.

The first five sections, as the editors explain and the Table of Contents shows, contain twenty-nine chapters, each with its own editor and numerous subchapters. That this wealth of ideas has been made available to educators is, in every sense of the word, a huge accomplishment. But then there is Section VI,

which consists of “a thorough gloss of more than twenty of the most eminent figures in education and human development.” Not only is this a valuable source of information about these seminal thinkers and their ideas, it is the basis for the sort of arguments that are always sparked by lists of the however many top whoevers in whatever field. Excuse me for being insufficiently solemn, but what fun! I think the editors are being a bit provocative here, and bless them for it. Section VII recognizes the socio-political nature of American education by offering information about nineteen organizations that have played significant roles in attempting to foster student and teacher development. Again there is fertile ground for debate over which organizations are included (TEAC?) and excluded (the NEA? AFT?), enough to keep educators not only reading but arguing for some time.

The point is that this is an undertaking of breathtaking ambition and scope, and the very fact that it exists is little short of astonishing. But unlike Dr. Johnson’s sexist and inaccurate judgment of women preachers—“Sir, a woman’s preaching is like a dog’s walking on his hind legs. It is not done well; but you are surprised to find it done at all”—one’s judgment of this volume is that it is not only remarkable for existing but for being of such outstanding quality. Admittedly, Professors Farenga and Ness had a bit of help. The list of contributors is striking for its breadth and the sheer volume of expertise it represents.

In short, this is a magisterial work, an indispensable volume that fulfills the grand ambitions of its editors. The term “encyclopedia” seems, these days, to be applied to any miscellany, any omnium gatherum, however slight. The *Encyclopedia of Education and Human Development*, however, fully deserves the designation “encyclopedia.” “Library” is almost not too grandiose a term.

James H. Borland
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I wish to acknowledge my co-editor, Daniel Ness. The synergy produced through our collaboration is really what made this project possible. I would also like to extend my appreciation to my family, Mark, Patrisha, and Jim Borland from Teachers College, Columbia University, who has served as a pinnacle of inspiration for me in my endeavors as an educational researcher.

S. J. Farenga

I wish to acknowledge my co-editor, Steve Farenga. Without him, this project would truly have been an arduous undertaking. I would also like to thank Susan Lin, Ming-hsiung Lin, Chia-ling Lin, Eric Ness, and Immanuel Ness, as well as Bruce Vogeli, Joe Hankin, and Herb Ginsburg from Teachers College, Columbia University, who have all had a profound influence on me with regard to academic research and the pursuit of knowledge.

D. Ness

We both wish to acknowledge the guidance of the members of our advisory board, namely, David Beacom from the National Science Teachers Association in Washington, DC; Linda Catelli from Dowling College in Oakdale, New York; Marie Danziger from Harvard University; Alan Lockwood from the University of Wisconsin at Madison; Gary Natriello from Teachers College, Columbia University; and R. Murray Thomas from the University of California at Santa Barbara. We thank Beverly Joyce from Dowling College, who provided a great deal of editorial support in the early stages of the project. Finally, we would like to acknowledge the editorial and managerial assistance provided by M.E. Sharpe. Their copyeditors deserve high commendation for their conscientious readings of the manuscripts. We would also like to thank Todd Hallman, Cathy Prisco, Jennifer Morettini, and Jim Ciment for their guidance in seeing this project through from beginning to end.

INTRODUCTION

Now, perhaps more than at any time in history, the subject of education has become an increasingly vital and even fashionable topic on numerous fronts—in politics, among researchers (whose disciplines include education as well as the liberal arts and sciences), parents and families, and among the general public. Moreover, educational institutions, both national and international, have been undergoing constant transformation in terms of assessment, instruction, curriculum, and institutional accreditation. Given the overwhelming spotlight on education in all forms of media and as a center of discussion among the general public, we provide here an authoritative text that considers issues and events in education, human development, and learning. It is therefore our pleasure to introduce you to the *Encyclopedia of Education and Human Development*.

From time to time, a reference work focusing on a particular topic related to the field of education is found. Some topics that come to mind include those in particular content areas (e.g., science and mathematics), group levels (e.g., early childhood, middle school education, higher education), and even psychology-related issues (e.g., cognitive studies, school psychology, development psychology). Furthermore, publications on general educational topics abound. For example, there are a number of handbooks on specific issues in education (e.g., multiculturalism, law, gender, social class) and content areas (e.g., mathematics, reading, science) and even developmental and educational issues in psychology and education.

During the past five or six decades, references in the field of education, for the most part, took the form of dictionaries. Some familiar dictionaries on terms and phrases in education of the 1970s and 1980s are those by Carter Good (1973), Gene Hawes (1982), P. J. Hills (1982), and Derek Rowntree (1982). Within the last few years, we have seen a few more refer-

ences in the form of dictionaries or sourcebooks, for example, a dictionary by John Collins and Nancy O'Brien and a sourcebook by Melvyn Freed, Robert Hess, and Joseph Ryan. But to our knowledge, this work is perhaps the only comprehensive set of volumes that covers a broad range of topics within the fields of education and human development.

We found the compilation of the numerous topics in education to be challenging. First, it was difficult to arrive at a consensus among educational experts as to what “the complete list” of topics in education and human development really is. To be sure, there is no complete list, and even if there were one, disparity would exist among specialists as to the categorization and inclusion of topics. And second, it was no easy task to identify experts with extensive background knowledge whose prose would appeal to large audiences. In addition, publications in this genre appear to be guided by a formulaic process in an effort to create uniformity in works with multiple authors. When this occurs, the reader may often recognize homogeneity in form, content, and tone for the entire work. Unfortunately, in this case, some of the unique expertise of the authors is lost. In this work, we preferred to limit homogenizing the words of the authors, allowing their individuality, experience, context and expertise from their specialized fields to reach the reader. We have been quite fortunate to find chapter and entry authors whose backgrounds are broad in scope and extend well beyond the boundaries of distinct disciplines or professional areas.

Before we discuss the content of the encyclopedia and the breakdown of topics into five broad categories (discussed below), we turn to two general concerns that have greatly influenced the field of education. The first is the role of politics and governance. And the second concern has to do with the impact of knowledge, that is, how humans come to

know things. Incidentally, the two issues of governance and knowledge, along with the problem of conduct, are of fundamental importance to the discipline of philosophy.

EDUCATION AND POLITICS

For the most part, the general public—teachers and parents included—putatively think of education as a societal good whereby children and adolescents are taught the so-called common discipline subjects (i.e., language arts, mathematics, social studies/history, science, and fine/visual arts) as a means of preparation for the workforce. With the accuracy of this belief aside, this is only one piece of the large education puzzle. Clearly, the institution and idea of education is much more than simply having twenty-five or so students in a classroom for seven hours a day, five days a week, 180 days a year. More specifically, what (or who) are the driving forces behind the institution of education? How were they created and developed? And whose interests are being served? If not those of the students, then whose? Based on relevant research, the *Encyclopedia of Education and Human Development* attempts to answer these challenging questions.

Education is politically driven. This should be quite clear when considering how teachers have been taught, how standards in various areas have been created and implemented, and why students are expected to use particular kinds of textbooks as opposed to others. Moreover, “educational reform” is a catch term in today’s media. What is educational reform? Were there educational reform movements eighty years ago? Twenty years ago? Ten years ago? How do the educational reform efforts of the 1920s or 1990s differ from present reform efforts? Educational reform is a politically charged term in that we hear arguments as to its meaning taken by different sides.

Political agendas in education have been often associated with the escalating “standards” movement, which has often ignored the interests of the students, and instead served those of its designers and supporters. The adherence to educational standards sounds beneficial in that we might often believe that their use provides structure and coherence when students are engaged in learning subject matter. But does the use of standards in education really reflect struc-

ture and coherence in particular content areas? A number of educational researchers and practitioners would argue that this is not the case at all. To begin with, there is little, if any, evidence to support the benefits of standards in any field or discipline. Although the designers of the standards have referenced studies in support of standards, works that have been cited often lack empirical evidence and are mostly anecdotal.

The institution of education has also been influenced by political agendas with regard to curriculum development. This influence can be examined through the textbook industry. Once again, we might take for granted the benefits of textbook use in schools. On the surface, one common misconception is that textbooks generally aid in organizing students’ knowledge in a particular subject area. Although this may be true in certain cases, textbook publishers have high stakes in the education industry. They tailor the content of the textbook not necessarily to foster cognitive skills, but often to court state education officials. In addition, these reforms change over time, and are based on the political penchants of the officials in power. So, for example, in the state of California, mathematics textbook series in the 1990s mostly focused on problem solving skills, concept development, and mathematical meaning. However, by 1999, the state education department favored a much more conservative position and advised textbook publishers to change the mathematics content to adhere to a more skill and drill curriculum. So, the use of a particular curriculum in education depends on the swing of the political pendulum.

We have invited experts in nearly all academic and professional arenas to write full-length chapters or entries on topics that impact the fields of education and human development. In addition to well-known scholars in education, we have invited authors in the fields of psychology, philosophy, sociology, history, mathematics, musicology, visual arts, and even law and medicine to share their insight in ways that elaborate on contemporary issues in education and human development.

EDUCATION AND KNOWLEDGE

As schooling plays multifarious roles in society, another primary purpose of education is, for the most

part, one based on knowledge development. If this is the case, then different groups of individuals will have different opinions about the importance of knowledge and cognition. Some will hold that knowledge develops the moral character of the individual, while others will say that the main reason for developing knowledge is perhaps more practical or mundane—to prepare youth for professional careers and the workforce. Or, that bestowing knowledge on students is important in that it will prepare students for college or the university. Whatever the reason might be, one will find in the *Encyclopedia of Education and Human Development* several chapters that deal with the topics of knowledge and cognitive development from a variety of perspectives. These include those from cognitive science, developmental psychology, and the psychomotor domains.

In general, there are at least two philosophical strands that have contributed to the meaning of knowledge, as well as how knowledge is to be imparted in an educational setting. The first is the view that society shapes and provides knowledge for the individual. This is often referred to as the materialist position put forth by the preeminent seventeenth-century philosopher John Locke. Well-known twentieth-century thinkers who were influenced by the Lockean perspective include the American behavioral psychologists Edward L. Thorndike and William Kilpatrick, and later Burrhus Frederick (B.F.) Skinner, and the Canadian social learning theorist Albert Bandura. The other argument takes the position that humans are generally born with virtue, and it is society that can either enhance or corrupt young children with regard to their intellectual and cognitive development. This position was held by the eighteenth-century philosopher Jean-Jacques Rousseau, and had a major influence on contemporary theories of cognitive development, particularly those of the twentieth-century developmental psychologists Heinz Werner of Germany and Jean Piaget of Switzerland, and the well-known physician and educator Maria Montessori from Italy. In the present day, there is a good deal of overlap between both philosophical strands among most cognitive scientists and psychologists. To be sure, post-Piagetian researchers today have countered Piaget's position on the origin and emergence of particular cognitive skills. For example, the researcher Rene Baillargeon has shown that human knowledge begins from birth—much earlier than Piaget had con-

cluded decades earlier. So, our understanding of knowledge and the possibilities of human cognition in general are always being modified with the development of new evidence.

We can conclude, then, that the construct of knowledge is a *sine qua non* factor in the educational enterprise. Without it, schools would be merely holding places for youth, lacking any type of environment for intellectual development. And perhaps more important, schools would not be in the business of preparing youth with the skills for the workforce or for furthering formal education.

HOW TO USE THIS ENCYCLOPEDIA

The *Encyclopedia of Education and Human Development* is divided into seven sections. The first five sections consist of twenty-nine chapters with anywhere from three to twelve entries in each. Each of the five sections deals with a specific area in the fields of education and human development. Section I is entitled “Constructs of Learning” and has to do with the necessary tools of education and human development—namely curriculum, instruction, and assessment. This section also discusses issues regarding specific subject matter knowledge, informal learning, and educational technologies. The authors of Section II—“Philosophical, Social, and Political Issues in Education”—examine education from its philosophical foundations as well as its social, political, and institutional influences that may influence educational policy. This section also includes chapters on moral education, at-risk issues, and motivation. Section III—“Levels in Educational Practice”—is unique in that readers will find the historical underpinnings and general policy practices associated with all of the conventional student group levels. These levels include early childhood, childhood (i.e., elementary), middle school, adolescent (i.e., high school), and higher education. The topic of higher education is divided into two chapters, one focusing on adult educational development and the second focusing on contemporary issues.

How do we determine the emergence of certain cognitive skills during the course of physical and intellectual development? Section IV—“Physical, Motor, and Cognitive Domains”—deals with this

question by focusing on specific issues with regard to physical, motor, language, quantitative, and spatial development. We begin with a thorough overview of physical and psychomotor development in the chapter entitled “The Psychomotor Domains.” We continue with a chapter on language development, followed by a discussion on the principles of semiotics in education. This section concludes with a chapter on the development of quantitative and spatial thinking.

Section V—“Educational Issues Concerning Diverse Populations”—examines diverse populations and how individuals of different backgrounds are prepared to assume their roles within society. The first chapter in this section deals with the diversity of learners with regard to ability levels. The next chapter focuses primarily on students with severe learning disabilities and ways in which institutions of education can foster conducive environments for these individuals. The chapter that follows examines medical and psychiatric concerns, which can have major effects on educational (as well as physical and social) development. The final chapter discusses the role of the parent and family with regard to the educational development of the child.

Section VI is a thorough glossary of more than twenty of the most eminent figures in education and human development, each selected as a result of numerous surveys we conducted with colleagues in the field of education. We asked each professional to name five “important” people in education and human development who have made outstanding contributions in the field. As the editors, we are fully aware that there are numerous important individuals in the field of education who may not be included in this section, though every attempt was made to include those individuals who had the greatest impact.

Section VII consists of nineteen well-known organizations that have played significant roles in attempting to foster student and teacher development. We have categorized these organizations according to the following five primary domains: (1) Subject Matter; (2) Child Related; (3) Teacher Related; (4) Educational Testing; and (5) Certification-Accreditation. As the editors, we understand that there may be a number of educational organizations that are not included. It is possible that those not included have similar missions to those you will find in Section VII. Again, every attempt was made to be as inclusive as possible within the designated length constraints.

It is our sincerest hope that you come away from the encyclopedia with a greater knowledge in a particular area of education and human development. We also hope that readers of all levels of expertise use this work for their own benefit—whether for pre- or in-service teachers, college or graduate students, college or university faculty, or anyone interested in the contemporary issues in the field.

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I

CONSTRUCTS OF LEARNING

CURRICULUM

In most faculties of education, research is focused on teaching or, as many prefer, “instruction.” The dominant interest is in learning *how* to teach more effectively, so that students can learn more quickly, as measured on standardized examinations. Such educational research is a form of social and behavioral science. While hardly disinterested in questions of pedagogy, the interdisciplinary field of curriculum studies attends to *what* knowledge is worth knowing. More influenced by scholarship in the humanities and the arts than by research in the social and behavioral sciences, the field studies the cultural, historical, and political questions that surround and inform the curriculum question: What knowledge is of most worth?

Traditionally, the field construed the problems of curriculum and teaching as “technical” problems, that is, problems of “how to,” of protocol. The contemporary field of curriculum studies regards the problems of curriculum and teaching as “why” problems. Such a view requires that we understand what was before considered only a problem to be solved (see Pinar et al. 1995). The methodological tools used to study these problems are provided, in the main, by the humanities and the arts, although social theory has been influential as well.

The study of curriculum can be organized into several scholarly discourses; among these the most important is the study of curriculum history. This has been a rapid and recent development. As the distinguished curriculum historian Herbert Kliebard (1992) observes in his *Forging the American Curriculum*, “When I was a graduate student there was no such thing as a curriculum historian.” Kliebard (1970, 1986), Daniel and Laurel Tanner (1990), Ivor Goodson (1983, 1984, 1988a, 1988b, 1989a, 1989b), Barry Franklin (1986), Doug McKnight (2003) Steven Selden (1988), and Craig Kridel (1989, 1991; see also Kridel and Newman 2003) are among

those whose scholarship has made history key in the contemporary field.

The traditional field was ahistorical (Kliebard 1970). Curriculum development itself was conceptualized according to protocol and orientation, often influenced by a scientific faith that the best was yet to come; that is, that more effective knowledge awaited more refined and rigorous scientific experimentation. The administrative or managerial character of the field’s origins cannot be overemphasized in this regard. There is no better example of this character than the Tyler Rationale (Tyler 1949).

“If any single volume deserves to be called the bible of curriculum making,” Philip Jackson observed, “it is certainly Ralph Tyler’s *Basic Principles of Curriculum and Instruction*. . . . A more influential text within the field of curriculum would be hard to name” (1992, 24). This thin book, which began as a syllabus for a course Tyler taught at the University of Chicago in the 1930s and 1940s (and published by the University of Chicago Press, first in 1949), “attempts to explain a rationale for viewing, analyzing, and interpreting the curriculum and instructional program of an educational institution” (Tyler 1949, 1). Tyler goes on to say that the book “outlines one way of viewing an instructional program as a functioning instrument of education” (p. 1). The heart of Tyler’s basic principles consists of four questions (to which he devotes separate chapters), which as Jackson points out, “a goodly number of today’s curriculum specialists, thanks to Tyler, probably know by heart” (Jackson 1992, 25). These four questions are:

1. What educational purposes should the school seek to attain? [Objectives]
2. What educational experiences can be provided that are likely to attain these purposes? [Design]

3. How can these educational experiences be effectively organized? [Scope and Sequence]
4. How can we determine whether these purposes are being attained? [Evaluation] (Tyler 1949; see Jackson 1992, 25)

Criticism of the Tyler Rationale was voluminous and, finally, decisive (see Jackson 1992; Pinar et al. 1995), except in the public schools, where versions of it remain in wide circulation.

In curriculum studies there has been, over the past thirty years, (1) a shift from focus on social engineering and the business model to the project of understanding, which involves the concept of curriculum as conversation; (2) the establishment of an intellectually independent—that is to say, not tied to specific pieces of legislation (such as the *No Child Left Behind Act* of 2001)—and academic field dedicated to understanding, and based primarily on research and theory in the humanities and the arts, not upon the social and behavior sciences; and (3) a shift from the emphasis on teaching (especially the technology of instruction) to curriculum, especially interdisciplinary configurations such as African American studies, women's and gender studies, and cultural studies (Pinar 2004).

In addition to the study of curriculum (however broad and complicated its definition) and its explicit interest in the school as institution (the sphere of “practice”), what is distinctive about contemporary curriculum studies is that it is the only area in the broader field of education in which the humanities and the arts, rather than the social and behavioral sciences, are influential. Indeed, much research conducted in the contemporary curriculum field can be characterized as theoretical, as that adjective is understood in the humanities and the arts (Pinar 2004).

Complementing historical studies, theory enables scholars to understand the present relations among culture, society, and politics in the structuring of school curriculum and curriculum research. Like the humanities and the arts, the academic field of curriculum studies is embedded in national culture, a fact underscored in the first international handbook of curriculum research (Pinar 2003). Because school curriculum and curriculum research are embedded in their respective national cultures, in the political present (a different present in different nations and regions), in cultural questions represented in vari-

ous curricula as well as in curriculum research, and in those public debates and policies surrounding those curricula and research, studying the academic field of curriculum studies locally and globally (as each is embedded in the other) enables scholars to strengthen their critical and intellectual distance from their respective cultures and from those processes of cultural standardization and economic exploitation threatened by the phenomenon of globalization.

The interdisciplinary field of curriculum studies is, then, committed to the study of educational experience, especially (but not only) as that experience is encoded in the school curriculum, itself a highly symbolic as well as institutional structuring of educational experience. As Madeleine R. Grumet (1988) has suggested, curriculum is what the older generation chooses to tell the younger generations. The school curriculum communicates what we choose to remember about our past, what we believe about the present, what we hope for the future. Curriculum debates—such as those over multiculturalism and the canon—are also debates about the American national identity (Castenell and Pinar 1993; Morris 2001, Doll 2000).

Because curriculum is highly symbolic, the study of curriculum requires situating it historically, socially, and subjectively (that is, in terms of life history and self-formation). Sectors of curriculum scholarship and research include efforts to understand curriculum racially, politically, theologically, autobiographically, and historically, in terms of gender, popular culture, phenomenology, postmodernism, poststructuralism, psychoanalysis, and the arts, all situated locally and in “the global village” (see Pinar et al. 1995). In this chapter I will summarize historical, political, racial, gendered, institutional, and international research. (For a comprehensive treatment of curriculum studies, see Pinar et al. 1995; Marshall, Sears, and Schubert 2000; Pinar 2003; Pinar 2004.)

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William F. Pinar

CURRICULUM HISTORY

To study curriculum comprehensively it is essential to portray its development historically. The ahistorical posture of the traditional field meant that “curriculum [has been] practiced with urgency in a crisis atmosphere that excludes contemplation of its evolution” (Hazlett 1979, 131). For instance, in the current wave of school reform, collaborative and small-group work is promoted with a naive enthusiasm, without realizing it is not exactly novel (see, for instance, Miel 1952). Traditional curriculum studies—in the past too often a support system for the school bureaucracy—was complicit in this capitulation to the “reform” *du jour*. As distinguished curriculum historian Herbert Kliebard (1970) made clear, the ahistorical and atheoretical character of traditional curriculum studies disabled teachers from understanding the history of their present circumstances.

Many scholars locate the birth of curriculum as a field of study in 1918 with the publication of Franklin Bobbitt’s *The Curriculum* (Kliebard 1986; Giroux, Penna, and Pinar 1981; Jackson 1992). Bobbitt argued for the reform of existing curricula modeled after what were then contemporary scientific notions of organization and measurement. However, his book crystallized a field that had been developing for many years. The scientific movement in curriculum, and in education generally, was responding to the earlier dominance of faculty psychology (in which the mind was regarded as a muscle to be exercised by memorization and recitation). Charles W. Eliot (1834–1926), president of Harvard University, was among the most visible scholars associated with the curricular ascendancy of faculty psychology. Faculty psychology was succinctly expressed in two documents, the Committee of Ten on Secondary School Studies (1893) and the Committee of Fifteen on Elementary Education (1895) (see Kliebard 1986). Some locate the birth of the field with the publications of these statements. Others choose 1923 and the Denver curriculum revision project: “According to Cremin, if the curriculum field had a beginning it was at Denver” (Tanner and Tanner 1990, 197).

British scholars tend to choose European origins. For instance, in his study of *Curriculum History*, David Hamilton (1990, 36) locates the contempo-

rary field in the historical shift from absolutism to the Enlightenment:

Overall, the transition from the age of absolutism to the age of Enlightenment was marked, in curriculum terms, by four processes. First, continuous attention was given to the search for new knowledge. Secondly, repeated attempts were made to develop taxonomies of knowledge (e.g., the taxonomic initiatives of Carl Linnaeus, 1707–1778) that might accommodate such new knowledge. Thirdly, such taxonomic attention led to the fragmentation (or specialization) of knowledge, as in the individual of separate *subjects*. Finally, growing attention to the concept of academic freedom—particularly after the founding of Berlin University in the early years of the nineteenth century—fostered repeated revision in the curricula of schools and universities.

HISTORICAL OVERVIEW OF THE FIELD

Hamilton (1989) chooses two dates as beginning points for the curriculum field: 1582 and 1633. He tells us that these two dates represent the earliest sources for the use of the term “curriculum” in university records. The earliest source of curriculum in the records of the University of Glasgow (Scotland) is 1633; for the University of Leiden (Holland), 1582 (Hamilton 1989, 43). Hamilton continues: “In the Leiden case, for instance, it was used in the form ‘having completed the curriculum of his studies.’ At Glasgow curriculum referred to ‘the entire multi-year course followed by each student, not to any shorter pedagogic unit’” (1989, 45). While acknowledging the persuasiveness of these different British and American arguments, I choose 1828 and the publication of the *Yale Report on the Defense of the Classics* (hereafter known as the *Yale Report*) as a reasonable beginning point for our study of the contemporary American field of curriculum.

Published in 1828, the *Yale Report* communicates clearly the faculty psychology that rationalized the classical curriculum (Sloan 1971). Faculty psychology was characterized by an emphasis on Greek and Latin as school subjects, and by an emphasis on memorization and recitation as instructional methods. David Hamilton (1989) notes that a “diversity of pedagogical thinking . . . suffused the recitation

label” (p. 139). Versions of both faculty psychology and the classical curriculum are discernible in contemporary curriculum debates nearly two hundred years later (see Pinar 2004).

In 1860 Spencer published his famous essay “What Knowledge is of Most Worth?” in the United States. Spencer insisted “the only purpose of education was to prepare for complete living.” His classification of life activities, in order of their importance, are as follows: (1) those ministering directly to survival; (2) those securing the necessities of life, contributing indirectly to self-preservation; (3) those which support the rearing and discipline of offspring; (4) those which support one’s social and political relations; and (5) those which comprise leisure time, satisfying tastes and feelings (Tanner and Tanner 1990; Hamilton 1990, 38). Spencer insisted that children “should be *told* as little as possible and induced to *discover* as much as possible” (Spencer 1860, 124–125).

What was Spencer’s significance? David Hamilton (1990, 38) tells us that three consequences followed. First, after Spencer came the notion that curriculum represented a selection from available knowledge. Second, curriculum was to be determined by reference to secular rather than spiritual purposes. Finally, through the construction and delivery of curriculum, the social progress of society can be promoted. Before the Enlightenment, curriculum was assumed to be a spiritual journey; afterward, curriculum denoted a means of social engineering and progress. In the *Yale Report*, we encounter a curriculum rationale based on faculty psychology, “a systematic and detailed psychology theory developed by some of Europe’s outstanding Enlightenment thinkers” (Sloan 1971, 244). (For a critique of Spencer’s significance, see Egan 2002.)

Faculty psychology postulated three constituent faculties or powers. First was the presence of will or volition, that faculty which enables human beings to act. Second were the emotions, those affections and passions that enable human beings to experience pleasure and pain, love and hate. Third was the intellect, or understanding, which enables human beings to reason, to think, to make judgments, and comprehend meanings (Rippa 1988, 198). There is a considerable scholarship on these fundamental notions (Kliebard 1986; Sloan 1971; Spring 1986; Egan 2002).

A “thoughtful, responsible attempt to consider the place of the undergraduate college in the totality of

the American educational scene” (Sloan 1971, 243), the *Yale Report* expresses two key concepts in faculty psychology: discipline and furniture. The aim of education is to expand the powers of the mind and to store it as knowledge. The former of these is perhaps the more important of the two. The primary aim in a curriculum, then, should be to call into daily and vigorous exercise the faculties of the student. The *Yale Report* stated that schools should adopt course content and teaching methods which are most likely to teach the art of focusing the power of attention and directing the train of thought. Curriculum should arrange, in the language of the report, the treasures which memory gathers. Habits of mind, the report continued, are not cultivated hastily; they require lengthy and continuous application. It compared the development of mental powers to those of manual powers. The “muscles” of the mind require the same routinized exercise as do those of the body (Pinar et al. 1995).

Based on faculty psychology, the school curriculum emphasized the classical subjects such as Latin and mathematics. These were to become organized arbitrarily into age-segregated groups, an administrative convenience which later supported elaborate schemes of psychosocial and cognitive development. In a review of curriculum making during the nineteenth century, Harold Rugg noted that instruction was organized around a dozen school subjects; it employed the reading and memorizing of textbooks. Textbooks were encyclopedic compendia of facts to be memorized, by means of which the mind became muscled (Pinar et al. 1995).

During the last decade of the nineteenth century, the National Educational Association (NEA) appointed three committees to make curriculum policy: the Committee of Ten on Secondary School Studies, the Committee of Fifteen on Elementary Education, and the Committee on College Entrance Requirements. Charles W. Eliot was the chairman of the Committee of Ten. These reports cast a mold for the school curriculum out of which it has yet to break free. As Cubberly (1920) observed: “The committees were dominated by subject matter specialists, possessed of a profound faith in mental discipline. No study of pupil abilities, social needs, interests, capacities, or differential training found a place in their deliberations” (p. 543). In his proposal for reform, Eliot recommended a reduction in curricular

time devoted to grammar and arithmetic so that the elementary school program could be diversified. However, the outcome of the committee's deliberations was to afford these subjects even higher priority in the curriculum than they had before. In fact, grammar now topped what had become the official list of important school subjects.

The consequence of the report of the Committee of Fifteen on the elementary curriculum was the solidification of the curricular status quo. Additionally, it is also clear that the report established what would become an important precedent, strengthening the role of subject-matter specialists as curriculum makers. Educational leaders who were opposed to classicism were distressed. For instance, among the Committee of Fifteen, Francis Parker's (the "father" of progressivism) reaction to the report was bitter. In protest, he demanded that a new committee be appointed. His calls went unanswered. Eliot, faculty psychology, and classical curriculum theory had triumphed in nineteenth-century America (Tanner and Tanner 1990). Loud echoes remain today (see Pinar 2004).

G. Stanley Hall (1844–1924) occupied a transitional place between classical curriculum theory and the Progressive movement of the 1920s and 1930s. Like Parker, Hall regarded child study as a means of educational reform. Also like Parker, Hall borrowed from evolutionary theory and its misapplication to curriculum theory, agreeing at one point that "ontogeny recapitulates phylogeny" (Cremin 1964, 104). Partly for this reason Hall became known as "the Darwin of the mind" (Hall 1923, 357–360). In 1883 he founded the first psychological laboratory in the United States, at Johns Hopkins University. In 1887 he launched the *American Journal of Psychology*, the first such journal in the United States. Like many in his generation, Hall envisioned the coming of a new era in which the intellectual elite—especially social scientists like himself—would design a better social world. The leadership position he imagined for academicians generally, and for psychologists more narrowly, would replace that of church leaders. (For a gendered and racialized critique of Hall's theories, see Bederman 1995.)

As the first decade of the twentieth century closed, faculty psychology fell victim to a triumphant experimental psychology. While Hall was instrumental in early skirmishes between the two forms of psy-

chology, it was Edward L. Thorndike (1874–1949) who is most identified with the ascendancy of experimental psychology in education. Thorndike was a student of William James. Like James, he discredited faculty psychology and mental discipline. James's experiments had failed to show any improvement in the faculty of memory as a result of memorization. Clearly, if memory could not be improved by memorizing it could hardly be rationalized as a major curriculum component (Kliebard 1986).

Thorndike continued James's attack on faculty psychology and promoted an experimental science of psychology no longer tied to philosophy (on which point he broke with his mentor). Thorndike found that no one discipline (be it Latin, Greek, mathematics, or any other subject) was more likely than any other discipline to develop the mind. Rather than a matter of mental discipline, learning was subject, even task specific (Tanner and Tanner 1990). To "prove" these views, the new science would adopt the research methods of the physical sciences, and thereby satisfy the demands of objectivity and verifiability. Education itself must be scientific as well, grounded in the foundation provided by the physical, biological, and social sciences, especially psychology. Thorndike promulgated these fundamental notions successfully from his position at what was then (and would remain for more than half a century) the nation's leading center for research and graduate training in education, Teachers College, Columbia University. Thorndike had joined the Teachers College faculty in 1889, and remained there for the duration of his career (Pinar et al. 1995).

Thorndike's major opus was *Educational Psychology*, published in 1913 (Rippa 1988). It would influence the field for decades to come. In direct opposition to the mental disciplinarians, Thorndike advocated a stimulus-response behavioral psychology. He believed that scientific knowledge of stimulus-response behavioral patterns would enable educators to alter human behavior so that it would come closer to coinciding to humankind's fundamental aspirations: "It is a first principle of education—to utilize any individual's original nature as a means of changing him for the better—to produce in him the information, habits, powers, interests, and ideals which are desirable" (Thorndike, quoted in Rippa 1988, 200). In prophetic words, Thorndike continued: "Education is a form of human engineering, and

it will profit by measurements of human nature and achievement as mechanical and electrical engineering have profited by using the foot, pound, calorie, volt, and ampere” (Thorndike 1922, 1). By reducing each human action to its smallest unit, that of stimulus and response, Thorndike and later John B. Watson (Watson et al. 1917), another major behaviorist, sought to establish the principles of human behavior that would permit its prediction (see also Cohen 1979). (For critiques of the historic role played by educational psychology in the study of curriculum, see Huebner 1999; Egan 2002; Pinar 2004.)

If Edward Thorndike provided the psychological legitimization for the social-efficiency movement, Frederick Winslow Taylor (1856–1915) provided methodological guidance via his theory of scientific management. Taylor had devised this theory early in the twentieth century. It was predicated upon economic practice, more specifically the structure of the workplace. Labor had evolved from a nineteenth-century emphasis upon craft guilds, an economic structure that required a master craftsman who taught apprentices his knowledge of the total production process. By the twentieth century this structure was rapidly disappearing, replaced by large factories wherein labor was specialized and routinized. Accompanying such a division of labor was a call for “scientific” management to supervise and control the various divisions. In this new era of mass production, effectiveness and efficiency were paramount. Scientific management asserted it could guarantee them (Pinar et al. 1995).

Essential to scientific management was the specification of the task to be performed. In his major work, *Principles of Scientific Management* (1911), Taylor characterized the “task idea” as the “the most prominent single element in modern scientific management.” Social efficiency experts viewed their work as a “mission” (Kliebard 1986). Rather than viewing curriculum as an opportunity to develop mental discipline, as “windows of the soul,” or as organized around the needs, interests, and abilities of the child, curriculum became the assembly line by which economically and socially useful citizens would be produced. Social utility, for these reformists, became the sole value by which the curriculum would be judged (Kliebard 1986).

What was meant by efficiency? Certainly, discipline and hard work were meant. As well, the idea

suggested notions of increased productivity and profits which mass production made possible. The idea of harmonious human relationships as necessary for the smooth functioning of the workplace was also included (Franklin 1986), an idea emphasized even more during the 1980s when the corporation rather than the factory became the model for school reform (Fiske 1991; Pinar 1994).

THE DEVELOPMENT OF THE FIELD OF CURRICULUM

John Franklin Bobbitt’s (1875–1956) *The Curriculum* (1918) is widely cited as the formal date of genesis of the curriculum field (Giroux, Penna, and Pinar 1981; Tanner and Tanner 1980; Schubert 1980, 1986; Kliebard 1986; Franklin 1986). Prior to the publication of *The Curriculum*, Bobbitt focused on ways to increase the efficiency of the school. In a 1912 article published in the *Elementary School Teacher*, entitled “The Elimination of Waste in Education,” Bobbitt decried the fact that the typical school plant was used only 50 percent of the time. To increase efficiency and economy, Bobbitt advocated that schools should be kept open Saturdays, Sundays, and summers.

Werret W. Charters’s (1875–1952) *Curriculum Construction* (1923) represents a major statement of the social efficiency orientation. Charters was not an administrator like Bobbitt. Rather, he was a teacher educator who had studied under Dewey in Chicago and who later claimed that Dewey had influenced him considerably (Seguel 1966). (Dewey, however, expressed reservations regarding Charters’s academic abilities and prospects.) Charters argued that curriculum was comprised of those methods by which objectives are determined. Thus, the content of curriculum is always methodological in nature. Charters’s method of determining the curriculum was activity analysis, a concept he borrowed from scientific management, a method he and his colleagues believed applicable to any curriculum development project.

To illustrate, Charles C. Peters extended Charters’s and Taylor’s notions to curriculum development in Christian education: “We shall need to pick out a hundred, or a thousand best Christians and study their characteristics. We shall need to observe their habits, their ideals, their beliefs, their attitudes, etc., and compare these so as to ascertain what ones are

common to all, or nearly all (and hence essential to Christianity) and what ones are merely accidental or personal” (quoted in Kliebard 1979, 213).

Probably the major reform movement of the first half of the twentieth century is the progressive education movement. Scholars trace the origin of this movement to four main figures: John Mayer Rice, Lester Frank Ward, Jane Addams, and most commonly, John Dewey (Cremin 1964; Seguel 1966; Tanner and Tanner 1980; Schubert 1980, 1986; Kliebard 1982, 1986; Westbrook 1991; Munro 1999). All four exercised influence upon the character of this political and intellectual movement in American education, a movement whose influence on day-to-day classroom practice has always been debated. Progressive education can be said to have been inaugurated in Quincy, Massachusetts, in the late 1870s, with the work of Colonel Francis Parker. Even during the time of the triumph of faculty psychology and the classical curriculum in the various NEA committees, progressive ideas did circulate nationally. For instance, some superintendents advised teachers to “individualize” their teaching. Highly visible educators such as Nicholas Murray Butler of Columbia and Charles De Garmo of Swarthmore endorsed child-centered curriculum reforms. Despite an apparent popularity of the progressive educational ideas with many teachers and their endorsement by renowned educators, traditional conceptions of education, that is, classical curriculum theory with its profound faith in mental discipline, maintained their grip on the vast majority, especially school superintendents and school board members during the nineteenth century (see Tanner and Tanner 1990, 104).

John Dewey’s (1859–1952) contribution to educational and curricular thought (1900, 1902, 1910, 1916, 1934a, 1934b, 1938) is incalculable. His influence is discernible in those who espouse his views as well as those who oppose them. Dewey entered the curricular debates at the turn of the century with a thin book that is one of his more accessible writings, *The Child and the Curriculum* (1902). Several scholars assert that in this essay one finds Dewey’s basic statement of curriculum theory (Kliebard 1986; Schubert 1980, 1986; Doll 1993). In this early book, a certain Hegelian influence is discernible in his insistence that the dualism or dichotomy between the child and the curriculum is a false one (Kliebard 1986; see Westbrook 1991). Apparent contradic-

tions, or in Hegelian (and Marxian) terms, thesis and antithesis, can be unified to produce a higher order of reality, or synthesis. Dewey joined others in criticizing the classical curriculum of the nineteenth century. Curriculum, he insisted, must not be an “external annex to the child’s present life” (Dewey 1964, 352–53).

Dewey’s criticism of the classical curriculum was insightful and unrelenting. He argued that the child’s experience must form the basis of the curriculum, and in so doing synthesize the apparent antagonism between the two. Dewey did not advocate freedom without adult guidance. Later, many of those claiming to work progressively would forget Dewey’s insistence that educational activity required careful pedagogical guidance. Dewey (1902) wrote: “Nothing can be developed from nothing; nothing but the crude can be developed out of the crude—and this is what surely happens when we throw the child back upon his achieved self as a finality, and invite him to spin new truths of nature or of conduct out of that” (p. 24). Partly in response to misunderstandings of Dewey’s position on freedom, Harold Rugg and Ann Shumaker would emphasize: “We do not dare leave any longer to chance—to spontaneous, overt symptoms of interest on the part of occasional pupils—the solution of this important and difficult problem of construction of a curriculum for maximum growth” (Rugg and Shumaker 1928, 118).

Some cite another Dewey book as launching the Progressive movement. In *The School and Society* (1900) Dewey asserts that schooling must participate in the reconstruction of society. Specifically, Dewey shared Ward’s view that students ought to discuss, plan, and effect meaningful social change. Schooling which ignored this dimension produced egocentric individuals. This potential for “selfishness” worried Dewey considerably. Dewey proposed the idea of school as community. For Dewey, community denoted students involved in so-called “active occupations,” not a vocational concept. Conducted in democratic and cooperative ways, these activities would revolve around the child’s experience. The child’s experience would be active rather than passive. Communication and ideas would be expressed relatively freely. The concept of school as democratic community might entail a school structured differently from its surrounding community, if the local environs lacked certain democratic qualities. This

possibility marks an important distinction between Dewey and Charters. For the latter, the school should mirror the larger community for which students are being prepared. For Charters, the primary goal of schooling was the production of graduates who would “do well” in the larger society. If that larger society exhibited democratic qualities, then so should the school. If society did not, evidently the school ought not. For Dewey, the ideal of democracy was supreme. It becomes clear that Dewey viewed the solution of social problems as a major focus of the curriculum. The goal of education was to improve society. This goal could not be reached, he insisted, unless the curriculum was constructed around the child.

During his time in Chicago, Dewey worked with Jane Addams (2002; see Munro 1999), a social reformer whose settlement house—Hull House—represented “an experimental bridging of class cultures” (Westbrook 1991, 85). Dewey had lectured at Hull House for several years before his move to Chicago, and when he did relocate was warmly received by the reform community (Westbrook 1991). Jane Addams educational ideas supported Dewey’s educational theories (see Munro 1999). Both Dewey and Addams believed that learning is a continuous and vital process, not preparation for a life to come later. It was Jane Addams who declared that the traditional school was unsuitable for learning because it was disconnected from life (Tanner and Tanner 1990), a view Dewey shared (Addams 2002; Elstain 2002).

Dewey’s ideas became institutionalized in the University of Chicago Laboratory School. Among the published records concerning the school is *The Dewey School: The Laboratory School of the University of Chicago* (1936). The authors, Katherine Camp Mayhew and Ann Camp Edwards, both teachers at the school, detailed the history and character of the curriculum. Mayhew and Edwards identify two periods in the school’s evolution. The first (1896–1898) was experimental in nature, guided by Deweyan principles of loyalty to the nature of children, “practical” acquaintance with various school subjects, and a concrete experience in the employment of scientific method. The second period (1898–1903) was characterized by revision of the curriculum based on analysis of what proved successful during the first period. The primary aim of the school was to foster “cooperative and mutually helpful living” (Mayhew and Edwards 1936, 39). This phrase, in Deweyan

terms, meant the cultivation of social awareness and a democratic vision (Dewey 1916).

As we have seen, the year 1918 is an important date in curriculum history. Bobbitt’s *The Curriculum* was published, providing theoretical legitimation for an expanding and accelerating social efficiency movement. As well, 1918 saw the publication of the *Cardinal Principles of Secondary Education*, a report met with applause, in contrast to the previous and controversial report issued by the NEA, the Committee of Ten report (1893). (Now it has come under severe criticism for overemphasizing vocational education, not only from historians of the curriculum but also from conservative school reform critics; see Ravitch 2000). Also that year *Teachers College Record* published William Heard Kilpatrick’s (1871–1965) “The Project Method.”

Kilpatrick’s 1918 essay “caused such an immediate sensation that the Teachers College Bureau of Publications was obliged to distribute an astounding 60,000 reprints” (Kliebard 1986, 159). Those critical of the social efficiency movement were worrying with Dewey that it would produce “selfish individualists” (Kilpatrick 1918, 334). Before projects were systematized into a “method” by Kilpatrick in 1918, they had been employed in the Dewey School before the turn of the century and in the Francis W. Parker School as early as 1901 (Tanner and Tanner 1990). According to Kilpatrick, from the standpoint of theory, the concept of activity was methodological. Despite Kilpatrick’s insistence that the project was a method and not a complete curriculum theory, in effect the project method was discussed as if it were a complete theory for curriculum development as well as a method. It would seem that the entire curriculum was to consist of a series of projects (Tanner and Tanner 1990; Ravitch 2000; Hirsch 1999).

George Sylvester Counts (1889–1974) was another important progressive reformer (Perlstein 2000). In *The Selective Character of American Secondary Education* (1922), Counts charged that the American schools served the moneyed classes at public expense, so that “misfortune, as well as fortune, passes from generation to generation” (Counts 1922, 148). Counts’s next major work, *The Senior High School Curriculum* (1926), reported the results of his 1923–1924 survey of fifteen American secondary schools in several cities. Counts reported that although curricular innovations had been attempted, results were

often disappointing. In his *The Social Composition of Boards of Education: A Study in Social Control of Public Schools* (1927), Counts surveyed 1,654 school boards to construct a profile of their composition (Kliebard 1986). Counts found that schools not only served the privileged, they were controlled by them as well. Counts quickly became the major figure on the left within the progressive movement. While social reform was an important element of Dewey's curriculum theory, it represented the major and even exclusive element of Counts's theory as well. While progressivism generally, and Counts's political curriculum theory specifically, would wane in the decades to come, political curriculum theory would reappear in the 1970s, this time explicitly identified with the work of Karl Marx (see Pinar et al. 1995).

In 1932, progressive education was ascendant. In that year George S. Counts published a pamphlet comprised of three papers read at several educational meetings that year, papers that stirred excitement and controversy. These were entitled "Dare Progressive Education Be Progressive?" "Education Through Indoctrination," and "Freedom, Culture, Social Planning and Leadership." The resulting pamphlet was the famous *Dare the Schools Build a New Social Order?* Viewing child-centeredness as a comfortable position compatible with the economic position of the privileged classes, Counts alleged: "The weakness of progressive education thus lies in the fact that it has elaborated no theory of social welfare, unless it be that of anarchy or extreme individualism. In this, of course, it is but reflecting the viewpoint of the members of the liberal-minded upper class" (Counts 1978, 7). Counts was adamant that the problems of American education could not be solved by child-centered schools. To become truly progressive, he insisted, progressivism must articulate a social vision. This "politicization" of progressivism frightened many, particularly as Counts refused to repudiate indoctrination. Many progressives feared that espousing a social ideology would result in indoctrination. Counts agreed, arguing that indoctrination is both inevitable and positive. "All education," Counts declared, "contains a large element of imposition. . . . It is eminently desirable. The frank acceptance of this fact by the educator," he concluded, "is a professional obligation" (Counts 1932, 12). Counts's *Dare the*

Schools Build a New Social Order? was a call to arms. Reactions ranged from "inspiring!" and "stirring!" to "impractical" and "un-American." Counts split the progressive movement beyond reconciliation, and this polarization began the slow erosion and ultimate demise of education's most memorable era.

Another notable scholar of the progressive period was Horace Mann Bond. While not directly involved with the progressive movement, Bond's (1934, 1939) historical scholarship shared Counts's analysis of American education as reproductive of the political status quo. Bond's Ph.D. dissertation (completed at the University of Chicago) on African American education in Alabama received a best dissertation prize; in paperback form it was reprinted in the 1960s (Urban 1992). At Dillard University in New Orleans, Bond designed the undergraduate curriculum, borrowing from the curriculum structure of the University of Chicago. As his biographer notes, however: "Bond did more than borrow the Chicago curriculum for Dillard. He added an emphasis on the special contributions of blacks. . . . He also stressed the social sciences, since these areas of study both provided the means for analyzing the problems blacks faced and pointed the way to their possible amelioration" (Urban 1992, 61).

Bond's scholarly career was perhaps surpassed by his accomplishments in administration (Urban 1992). Bond served not only as Dean at Dillard, but also as the president of Fort Valley State College in Georgia and of his own alma mater, Lincoln University in Pennsylvania. Additionally he served as dean of Atlanta University's School of Education. Despite the demands of administration, Bond managed to publish studies of issues in African American educational life (1959, 1972, 1976). Moreover, he traveled frequently to Africa during the 1940s and 1950s, striving to support educational, political, economic, and cultural relations between Africans and African Americans. Bond is the father of Julian Bond, the well-known civil rights activist of the 1960s. Horace Mann Bond's understanding of the profoundly conservative character of American education, particularly in the racial sphere, represents a significant moment in the advancement of curriculum knowledge. Bond's work foreshadowed the establishment of race as a central curriculum discourse.

CONTEMPORARY CRITIQUES IN THE FIELD

During the years immediately after World War II, the social efficiency movement reclaimed lost status and power. This time it eschewed its explicit embrace of scientific management and American industry for a concept called “life adjustment education” (Kliebard 1986, 240–270). The surface parallels between the earlier view of curriculum preparing students for productive vocational lives and this view of adjustment to life are self-evident. In his widely read *Anti-Intellectualism in American Life*, Richard Hofstadter (1962) characterized life adjustment education as a movement stemming from the wide sweep of progressive educational reforms beginning before the twentieth century (see also Lasch 1978; for a critique of Hofstadter’s and Lasch’s critiques, see Pinar 2004). In fact, the term was first used in 1945 in connection with the neglect of the majority of high school youth who were not going on to college. Life adjustment never became a “movement,” yet the label was used by such historians as Arthur Bestor in his attack on the field of education six years later (Tanner and Tanner 1990).

There was a specific event, however, that mobilized American public opinion against not only the life adjustment movement but against what now right-wing critics dismiss as the “education establishment.” It would mean that curricular control would be wrested from public school teachers and from curriculum specialists in the universities. The specific event in question was the launching of the Soviet satellite in 1957. The Sputnik satellite launching created a national reaction that propelled curriculum discussion forward to an immediate and enduring obsession with science and technology. Simply stated, the Soviet success cast doubt on the quality of the American educational system. If our schools were strong, the public press demanded to know, why had the Soviets defeated us in the race to travel in space?

Admiral Hyman Rickover led the charge in his *Education and Freedom* (1959) and *American Education—A National Failure: The Problem of Our Schools and What We Can Learn from England* (1963). Rickover’s charges will ring familiar to today’s reader, as they have also been employed by conservative critics in the decades following, among them William Bennett, Diane Ravitch, and E. D.

Hirsch Jr. Rickover blamed the schools for military reasons (as in the case of Sputnik); later critics would focus on economic setbacks (as in the case of Japan and the U.S. trade deficit) and moral setbacks (National Commission on Excellence in Education 1983).

The first major event in post-Sputnik curriculum reform was a 1959 conference held at Woods Hole on Cape Cod, Massachusetts, and attended by psychologists, scientists, and mathematicians (not by curriculum specialists). The Woods Hole Conference was organized by the National Academy of the Sciences and supported by the National Science Foundation, the Air Force, the Rand Corporation, the U.S. Office of Education, the American Association for the Advancement of Science, and the Carnegie Corporation (Tanner and Tanner 1980, 523). A curriculum manifesto followed that would frame the National Curriculum Reform Movement.

That curriculum manifesto was Jerome S. Bruner’s *The Process of Education* (1960). In this influential book, Bruner outlined a curriculum theory based on the notion of disciplinary structure. Bruner argued that each discipline exhibited a particular structure that could be made accessible to every student. Understanding a discipline’s structure enabled the student to understand how a discipline worked: how it understood its problems, what conceptual and methodological tools it employed to solve those problems, what constituted knowledge in the discipline. Students’ understanding of disciplinary structure would enable them to learn essential disciplinary knowledge, regardless of their cognitive level. A decade later Bruner would do a complete about-face. The social, political, and racial crisis of the 1960s persuaded him that the curriculum must address issues other than those associated with the structures of academic disciplines (Pinar et al. 1995).

The theory of the structure of the disciplines was elaborated at a 1963 Conference on the Structure of Knowledge and the Curriculum held at San Diego State College. The proceedings, published as *The Structure of Knowledge and the Curriculum* (1964) and edited by G. W. Ford and Lawrence Pugno, attempted to map fundamental concepts and methods of inquiry for specific disciplines. Perhaps the most systematic attempt to do so was made by University of Chicago Professor Joseph Schwab (1978; see Block 2004). In “Structure of the Disciplines: Meanings

and Significances,” Schwab (1978) asserted that there were three “major but related sets of problems which define the area called the structure of the disciplines” (p. 10). First was the problem of determining the membership and organization of the disciplines, including identification of particular disciplines and their relations to one another. Second was the problem of identifying the structure and limits of the disciplines, structures Schwab termed “substantive.” Third was the problem of the “syntactical structure of the disciplines,” which included the “canons of evidence and proof” and “how they can be applied” (p. 14). Schwab cautioned (1978) against dogmatic adherence to disciplinary structures in curriculum development:

We may, if we like, choose but one of several pluralities of bodies of knowledge. But if we do, let it be taught in such a way that the student learns what substantive structures gave rise to the chosen body of knowledge, what the strengths and limitations of these structures are, and what some of the alternative structures are which give rise to alternative bodies of knowledge. (p. 29)

Astute critics of the 1960s curriculum reform movement have understood that military and nationalistic objectives were buried in erudite discussions of the structures of the disciplines. In the Bruner/Schwab scheme, learning was to serve as a means for further specialized learning. The long-range purpose, however,

was neither personal development nor social reform but national power. We were a warfare state seeking international supremacy in military-related scholarship. Paradoxically, the disciplinary doctrine was focused on an abstract view of knowledge to the neglect of applied knowledge. Without practical application the possibilities for transfer were limited. (Tanner and Tanner 1990, 178)

Unfortunately, astute critics were few in number and lacked influence in the 1960s, and in the avalanche of money and prestige accompanying the structure-of-disciplines approach, curriculum specialists’ critiques of the movement were ignored.

Among the major critiques of the theory of the structure of the disciplines was James B. Macdonald (1995). In 1966, Macdonald and Robert Leeper edited *Language and Meaning*, in which the discipline-

centered and scientific orientations of the period were challenged by asserting the primacy of meaning in the process of education: “Language, after all, is the vehicle by which most teaching is accomplished. Meaning is the human goal of learning, the ultimate test of any curriculum change” (Combs, quoted in Macdonald and Leeper 1966, *v*). Macdonald’s essay, “Learning Meaning and Motivation: An Introduction,” discussed the problems associated with the structure-of-the-disciplines movement and urged a concern for the person:

There is, after all, no reason to suspect that the reformulation of content alone in the schools will suffice to counter the loss of self, the dehumanization and depersonalization of people living in a technological society such as ours. Further, there is no reason to suspect that the structure of the disciplines can by magic of organization reduce the threat of nuclear holocaust, bring justice and equality to all people or provide a basis for freedom from poverty for all. (Macdonald and Leeper 1966, 5–6)

This challenge would constitute the thematic heart of the field’s reconceptualization during the 1970s (see Pinar et al. 1995; Pinar 1999).

A second major statement by Macdonald was published in *Precedents and Promise in the Curriculum Field* (Robison 1966). Dwelling on the theme of dehumanization, Macdonald advocated a person-oriented curriculum:

We will create our own image of ourselves through the ways we structure and relate to our own world. This image is in dire peril of becoming characterized by a partially ordered and conditioned set of regimented performances in the modern age. What we must strive for is to make men what they ought to be—complete human beings. (Macdonald, quoted in Robison 1966, 52)

The current school structure, Macdonald asserted, was dehumanizing. What was necessary was a reconceptualization of what school and curriculum could be, the cultivation of self-conscious and complete human beings. Macdonald had sounded a challenge that would be repeated over and over again in subsequent scholarship.

A major curriculum conference was held in 1967 at the Ohio State University, chaired by Paul R. Klover (Klover 1967a, 1967b, 1967c). Proceedings were edited by Klover and published in *Theory into Practice*. Klover (1967b) observed: "The individuals who planned the Ohio State University Curriculum Theory Conference . . . were determined, if possible, to examine curriculum theory in the making" (p. 165). At the Ohio State conference Macdonald delineated between "framework" and "engineering" theories at work in curriculum. Framework theorists were said to interpret curriculum issues by means of "aesthetic rationality," a concept Macdonald borrowed from Herbert Marcuse (1966), the well-known critical theorist widely read during the 1960s. Macdonald argued that aesthetic rationality pointed to the human capacity to cope rationally with the world on an intuitive basis. The individual must return to the world as experienced for insights that enabled one to transcend one's present systems of thought and to move to new paradigms or fresh perspectives.

Another speaker at the Ohio State Conference was Teachers College, Columbia University Professor Dwayne E. Huebner (1999). Trained at the University of Wisconsin by Virgil Herrick (as was Macdonald), Huebner's work would be enormously influential in subsequent scholarship. After completing a statistical dissertation, Huebner experienced an intensifying dissatisfaction with his own education and the education of those around him. He committed himself to study theology and philosophy, and to bring aspects of those fields to the study of curriculum. In a 1963 essay entitled "New Modes of Man's Relationship to Man," Huebner worked to shift curricular attention away from the disciplines' structures to how persons are in relation to each other. He relied on third-force psychology and existentialism, and foreshadowed several themes he and others would take up later. Among these was the matter of curriculum language. Huebner worked to "make the educator aware of his limited, and limiting thought patterns and language systems for shaping values and legitimizing action" (Huebner 1963, 162).

In his 1966 "Curriculum as a Field of Study" Huebner advanced four radical propositions. First, he argued that conceptions of curriculum tended to be tied to technique and not linked to the human spirit. Second, the field suffered from an overdependence upon values conceived as goals or

objectives. Furthermore, the field suffered from an overdependence upon learning as the primary expression of human temporality (see Pinar et al. 1995, chapter 8, for a discussion of Huebner's articulation of curriculum as concern for temporality). Third, correction of this conception of curriculum could be achieved partially by the design of an educative environment conceived as valued educational activity. Fourth, Huebner insisted that curriculum design was inherently a political process used by the curricular worker to attain a just environment. Like Macdonald and Eisner, Huebner endorsed art as a model of curriculum theory and design.

Huebner studied marginalized intellectual traditions for a new language for curriculum. The titles of his essays during the 1960s illustrate his search: "Politics and the Curriculum" (1962), "Curriculum as a Field of Study" (1966a), "Curricular Language and Classroom Meanings" (1966b), "Curricular Concern for Man's Temporality" (1967), "Implications of Psychological Thought for the Curriculum" (1968), and "Language and Teaching: Reflections in the Light of Heidegger's Writing About Language" (1969). Like Macdonald, Huebner created a literature quite different from the dominant "scientific" orientation, drawing upon existentialism, phenomenology, theology, and political theory. As these titles indicate, his scholarly range was broad; his focus traversed the daily exigencies of the classroom to fundamental questions regarding the character of the curriculum field (see Huebner 1999).

Other figures important in the critique of the structures of the disciplines approach included Stanford University Professor Eliot W. Eisner (1967, 1969, 1971a, 1971b, 1972a, 1972b) who was instrumental in creating a literature we have termed "curriculum as aesthetic text" (see Pinar et al. 1995) and in qualitative evaluation (see Pinar et al. 1995). Also influential was philosopher of education Maxine Greene, who emphasized the importance of the arts and humanities, especially philosophy and literature (Greene 1965a, 1965b, 1971, 1973, 1974, 1978, 1988, 1995; see also Pinar 1999; Miller 2004).

A major commentator on the field and soon to become its most important historian, Herbert M. Kliebard discussed the fragmentation of knowledge in its bureaucratization. In "Structure of the Disciplines as an Educational Slogan" (1975a) and "Bu-

reaucracy and Curriculum Theory”(1975b) Kliebard criticized the use of scientific management and the disciplines approach in curriculum. He questioned the “product” orientation associated with the former. Kliebard observed that the dominant metaphor for curriculum theory in the early twentieth century was borrowed from corporate management (Kliebard 1975a). In particular, he examined the influence of scientific management upon curricularists such as Bobbitt. This influence had resurfaced in the 1960s and would continue into the 1970s.

Kliebard (1975a) criticized the curriculum field for its ahistoricity. In other disciplines, he noted, progress is achieved through a dialogue between contemporary practitioners and their historical predecessors. The field of curriculum lacked this dialogue. It is “characterized by an uncritical propensity for novelty and change rather than funded knowledge or dialogue across generations” (Kliebard 1975a, 41). The field’s ahistorical posture permitted bureaucratized, standardized, and fragmented curriculum conceptions to be promoted as “new.” Kliebard (1975a) advised: “The work of the next fifty years in the curriculum field is essentially developing alternatives to the mode of thinking and the limited framework that have so clearly dominated our first fifty years” (p. 49). Those committed to a reconceptualization of the field in the 1970s took his advice very seriously indeed (see, for instance, Pinar 1999).

Accompanying the politicization of U.S. school reform in recent decades has been an effort by right-wing critics to rewrite curriculum history, conflating Deweyan progressivism with Bobbitt and Charters’s social efficiency (see Ravitch 2000). Increasingly, this sector of scholarship looms large in the study of curriculum (see, for instance, Kridel and Newman 2003; McKnight 2003). Certainly it is the terrain of politicized debate today (see Pinar 2004).

William F. Pinar

UNDERSTANDING CURRICULUM POLITICALLY

The systematic effort to understand curriculum politically asserted itself in the curriculum field in the

1970s. In contrast to the earlier efforts of Counts and Rugg (see Pinar et al. 1995), the political scholarship in the 1970s was avowedly Marxist and neo-Marxist in nature (see Stanley 1992 for more nuanced details). Developments in Britain also influenced American theorists (especially see the work of Bernstein 1977; Whitty and Young 1976; and Willis 1981).

Termed variously as the new sociology of curriculum, radical or critical curriculum theory, or politically oriented curriculum theory, this large body of work has extended its range of interests far beyond usual concepts of the political, focusing in recent years, for instance, on subjects as varied as Disney (Giroux 1999), Barbie (Steinberg 1997), and McDonald’s restaurants (Kincheloe 2002). Despite its broad range, it is possible to summarize its contributions. Certainly, one of its contributions is the view that curriculum can be understood in any comprehensive sense only if it is contextualized socially, economically, and politically (Carlson 1992, 2002). Put simply, curriculum cannot be grasped unless it is viewed in context (Cornbleth 1991).

Today no serious curriculum scholar would advance the argument that schools in general and curriculum in particular are politically neutral. Yet the political neutrality of school curriculum was a commonplace assumption in the pre-1970s literature. That the idea is largely discarded today represents one testimony to the influence of this body of curriculum scholarship. While there are many differences among political theorists, differences that have led to lively and sometimes contentious exchanges, it is possible to speak very generally about what they tend to share. Political theorists tend to view American society as rife with poverty, homelessness, racism, and political oppression. While they tend to blame these problems on the economic system (i.e., capitalism), they do regard the schools as participating in this general system of injustice and suffering. There is a visionary element among political theorists, as they tend to call for an empowered citizenry capable of altering their circumstances in favor of a more just society. The school in general and the curriculum in particular play important roles in both oppression and reform. First, we will turn to the role of curriculum in oppression, elaborated nearly twenty years ago as reproduction theory.

The first step in the effort to understand curricu-

lum as a political text involved the concept of reproduction or correspondence. In their widely read *Schools in Capitalist America*, S. Bowles and H. Gintis (1976) regarded schools as functioning in the stratum of superstructure, a stratum determined by society's economic base. A concept imported from other fields aided politically oriented curriculum scholars to advance their arguments. Louis Althusser's (1971) notion of ideology provided another major concept in curriculum scholarship (see McLaren 1989).

The hidden curriculum was another important conceptual tool for politically oriented curriculum scholars in the 1970s, first popularized by Philip Jackson (1968, 1970) and recently reformulated as "curricular substructure" by Jackson in the 1990s (Jackson, Boostrom, and Hansen 1993, 14ff). The concept refers to those unintended but quite real outcomes and features of the schooling process (Dreeben 1976; Apple 1975; Giroux 1983; McLaren 1989). The "hidden curriculum" is distinguished from the overt curriculum, or the planned curriculum, including objectives.

Michael W. Apple (1975) defined the hidden curriculum in a way that pointed to the concept of hegemony, borrowed from the Italian Marxist Antonio Gramsci (1971), who borrowed the term from Karl Marx and Friedrich Engels (1974). Gramsci employed hegemony in two senses: first, hegemony referred to a process of domination whereby the ruling class is said to exercise political control through its intellectual and moral leadership over allied classes. (This is the sense in which Marx and Engels employed the term.) Second, hegemony referred as well to the use of force and ideology in the reproduction of class relations (see Aronowitz and Giroux 1985, 88). Thus hegemony is understood to occur via the use of force and via the shaping of human consciousness.

Philip Wexler and Tony Whitson (1982) criticized the prevailing use of hegemony in political scholarship. Despite Wexler and Whitson's cogent criticisms, mainstream political scholars continued to employ hegemony as they had, to refine the basic "base/superstructure" model of reproduction that had been accepted during the 1970s. By the late 1970s, Henry Giroux and other political scholars came to worry that an overreliance upon the concept of reproduction risked a discourse of despair. If reproduction

occurred as incontestably as Bowles and Gintis and many critical curriculum scholars of the 1970s insisted that it did, there was little hope for significant change, aside from alterations in the economic base (i.e., socialism).

In his widely read *Learning to Labour*, Paul Willis (1981) introduced the concept of resistance to an eager audience now disenchanted with reproduction theory. Willis observed that the working-class boys he studied resisted both the official and hidden curriculum of their English secondary school. The roots of this resistance, he wrote, "are in the shop-floor cultures occupied by their family members and other members of their class" (Giroux 1983, 283). Willis's concept of resistance allowed political theorists to view the process of reproduction as contestable. The early 1980s saw considerable discussion of resistance theory. Attention to the significance of resistance in understanding curriculum continues to the present day (see, for instance, Munro 1998; Pitt 2003).

The shift from reproduction to resistance in curriculum political theory was evident in two 1983 texts: Henry A. Giroux's *Theory and Resistance in Education: A Pedagogy for the Opposition* and Michael W. Apple and Lois Weis's *Ideology and Practice in Schooling*. In both books one can still discern some movement away from reproduction theory. For Giroux, resistance pointed to possibilities of oppositional pedagogy (1983). He called for a reformulation of the relations among ideology, culture, and hegemony, one which would "make clear the ways in which these categories can enhance our understanding of resistance as well as how such concepts can form the theoretical basis for a radical pedagogy that takes human agency seriously" (Giroux 1983, 111). Apple and Weis also discussed the movement beyond simple reproduction theory, stating that "hegemony is not and cannot be fully secure" (Apple and Weis 1983, 28). Their view that the cultural sphere was relatively autonomous led them to move beyond resistance to a belief in the possibility of meaningful intervention in the schools. However, they cautioned that this action must be a kind of praxis and that the connections between the schools and the larger society must be made.

By 1985 scholarly efforts to understand curriculum politically began to turn away from reproduction and resistance theories to issues of political and pedagogical practice. This shift away from resistance theory

was evident, for example, in the work of Henry A. Giroux, which, beginning in 1985, moved to questions of literacy, the liberal arts, and transformative or critical pedagogy (Giroux 1988). In his 1985 *Education Under Siege*, co-authored with Stanley Aronowitz, Giroux discussed reproduction and resistance insofar as they led to radical action (Aronowitz and Giroux 1985). In the field of curriculum a “language of possibility” was necessary. Educators must become transformative intellectuals rather than “skillful technicians.” What is now necessary was to “link emancipatory possibilities to critical forms of leadership by rethinking and restructuring the role of curriculum workers” (p. 142).

This move toward emphasizing the agency of teachers and students was heard by receptive ears. For instance, Dennis Carlson (1992) worked to establish the basis for a view of teachers as an important force for transformative change in the schools. Jesse Goodman (1992) studied an alternative school in Bloomington, Indiana (the Harmony School) that seemed to institutionalize this teacher-led transformation. The emphasis upon pedagogy and agency recalled, for many, the work of Paulo Freire (1968), as several collections testified (McLaren and Leonard 1993; Darder 2002).

The effort to understand curriculum politically shifted then, from an exclusive focus upon reproduction of the status quo to resistance to it, to a focus upon daily educational practice, especially pedagogical and political issues of race, class, and gender. The major players in this effort continued to be Apple and Giroux—Apple through his voluminous scholarship and that of his many students and Giroux through his prodigious scholarly production. By decade’s end, three other scholars would become major contenders in controlling the conversation among political theorists: C. A. Bowers, Philip Wexler, and Peter McLaren.

One of the most vociferous critics of Marxist curriculum scholarship was C. A. Bowers (1980, 1981, 1984, 1986, 1987; 1991a, 1991b, 1995, 2000). His critiques have spanned a fifteen-year period and a wide range of issues. While Bowers’s criticism of political theory has occasionally sparked a return volley (McLaren 1991), his contribution more generally has, unfortunately, been overlooked and undervalued by the American field. Ignoring scholarship which political theory opposes has been one of its

strategies over the past twenty years, a strategy that has helped lead to the current balkanization of the American field. Bowers’s scholarship extended the range of political theory from the social world to the planet earth. The ecological crisis has received increasing attention in recent years, in large measure thanks to Bowers (see also Gough 2003).

Perhaps the most brilliant and caustic critic of political analyses of curriculum was Philip Wexler, himself an “insider” to debates regarding base/superstructure, ideology, hegemony, and so forth (Wexler 1976). Central to Wexler’s analysis is the linkage of academic work to social movements outside the academy. He pointed out, for instance, that the political study of curriculum arose in the aftermath of the radical student and civil rights movements of the 1960s. Wexler charged that radical critics romanticized that movement. Political scholarship “neglected its own historicity,” and following the decline of the 1960s student radicalism, it appeared as a post-movement discourse that “recapitulates that defeat, restating it abstractly and obsessively” (pp. 4, 27). Politically oriented scholarship, then, amounted to little more than “a displaced imitation of it [the student movements of the 1960s], an attempt culturally to recapitulate the practical historical course of the movement, *in theory*” (Wexler 1987, 26).

Perhaps the most important move away from reproduction and resistance theory to an interest in cultural politics was research on so-called popular or everyday—rather than “high”—culture. Now decrying that both reproduction and resistance models were limited and limiting, Giroux and Simon et al. (1989) argued that schooling must be “analyzed as part of a complex and often contradictory set of ideological and material processes through which the transformation of experience takes place” (p. 1). In this view, educational practice became both a “site and a form of cultural politics” (p. 11). Such practice enabled teachers and students to “intervene in the formation of their own subjectivities and to be able to exercise power in the interest of transforming the ideological and material conditions of domination into social practices that promote social empowerment and demonstrate possibilities” (Giroux and Simon et al. 1989, 11). Interest in popular culture and, in particular, popular media has intensified in the last fifteen years (see, for instance, Daspit and Weaver 2000, Ellsworth 1997).

Joe Kincheloe’s (1993; Kincheloe and Steinberg

1992, 1993) synoptic scholarship illustrates well the current expansive, incorporating phase of political theory, including its efforts to domesticate and thereby employ postmodernism (see Doll 1993). Kincheloe's (1993) postmodern political view is informed by liberation theology (p. 72), a theory of place and difference (pp. 69, 215), feminist and gender theory (pp. 154–155, 214), Jungian synchronicity (p. 171), ecology (p. 172), popular culture (p. 85), qualitative research (p. 91), and shows the influence of Henry Giroux and especially Peter McLaren. This influence is evident in Kincheloe's framing of postmodernism in his *Toward a Critical Politics of Teacher Thinking: Mapping the Postmodern* (1993). Postmodernism has been evident in the politically engaged scholarship of Peter McLaren (1997, 2000).

The decentering consequences of postmodernism and poststructuralism undermine what many see as the latent authoritarianism of the political perspective, including its thinly concealed self-righteousness and its employment of class guilt (manipulated, some said, by a false identification with the working class) to enlist loyalty (Beyer and Wood 1986; Wexler 1987). In undermining this central psychodynamic of political curriculum theory, postmodernism threatened the political enterprise as the field has known it for the last twenty years. Indeed, some would say it has splintered into its constituent elements, among them race and gender studies (see Pinar et al. 1995).

William F. Pinar

RACE AND CURRICULUM

Political theorists subsumed the subject of race within political theory. Among these are those theorists and scholars who tend to insist that the political character of curriculum is its most significant feature. The view of most curriculum studies scholars today, however, is that race must be regarded as an autonomous concept in the effort to understand curriculum. Of course, political considerations are important in the racial constitution of curriculum. For instance, the exclusion of third-world literature from school literature courses reveals a political aspect of canon formation. The battle over the canon involves aesthetic issues as well as historical and psychosocial

ones. However, there is an autonomous domain of race that cannot be reduced to these related discourses and issues. The power and complexity of scholarship on race and curriculum recommend its status as a major contemporary curriculum discourse. In this entry I will focus primarily upon race as related to the experience of African Americans, given the centrality of that experience to the constitution of the American nation (Castenell and Pinar 1993).

The effort to understand curriculum racially may well develop, as William Watkins (1993) suggests of "black curriculum orientations," both autonomously and intertextually, that is, "as both a part of and separate from the mainstream curriculum movement" (p. 321). Certainly racial theory must not be viewed as a form of intellectual segregation. The effort to understand curriculum as racial text would appear to be such an intellectual community, simultaneously separate and integrated within the field at large.

Before the reconceptualization of the curriculum field in the 1970s (see Pinar et al. 1995), race was regarded as marginal to the effort to develop and understand curriculum, as perusal of the historical scholarship indicates. It is now reasonable to argue that race has become central to the field, a status also supported by the intensity of public debate over multiculturalism. Until recently, however, even politically oriented curriculum scholars have tended to overlook race, ascribing marginal status to it. Cameron McCarthy (1988a, 1988b, 1990, 1993a, 1993b, 1998; also see Dimitriadis and McCarthy 2001), one of the theorists whose scholarship has been instrumental in moving racial theory to center stage, observed that those in "education have been far more forthcoming in their examination of how the variables of class and, more recently those of gender, have informed the organization and selection of school knowledge and the production and reproduction of subcultures among school youth [than they have been in their examination of race]" (McCarthy 1988a, 265).

Separated from the effort to understand curriculum politically, where it was under-theorized, race moved to center stage in curriculum discourse. Certainly the public interest in and the debate over multiculturalism have helped to support its growth in the curriculum field. Racial discourses can be regarded as occupying an expanding space between political and feminist theory, intersecting with both but independent of each (see Pinar 2001).

In an important essay published in the fall 1993 issue of the *Harvard Educational Review*, William H. Watkins summarized black curriculum orientations and situated them historically. Watkins employed the notion of curriculum orientation, which he linked with the work of Schubert (1986), Giroux, Penna, and Pinar (1981), Kliebard (1986), and Eisner and Vallance (1974). However, the notion of curriculum orientation derives not only from antecedent formulations within the field but also from “complex overlapping historical forces” (p. 323). Watkins lists the following six orientations: functionalism, accommodationism, liberalism, reconstructionism, Afrocentrism, and Black Nationalism.

Functionalism characterized black education in the eighteenth and early nineteenth century. Functionalism is an orientation characterized by self-effort, religious altruism, and “the involvement of benevolent Whites” (Watkins 1993, 323). One such benevolent person was Sarah Grimké, who admitted that: “The light was put out, the keyhole secured, and flat on our stomach before the fire with spelling books in our hands, we defied the laws of South Carolina” (quoted in Watkins 1993, 323–24). Watkins notes that there may have been sufficient permissiveness in slave society to permit limited education to occur. Such education was shaped by the conditions of slavery and directed to basic human survival: “This preparation for life is at the center of the functionalist curriculum. Consistent with colonial education, functionalism is typically basic, largely oral, and frequently includes folklore as part of its curriculum” (Watkins 1993, 324). Such education can be likened to early colonizing efforts in British West Africa, for instance. Slavery in the American South made educational efforts colonial in character. Even as informal black education became more formal, functionalism remained a significant orientation.

Watkins tells us that while functionalism is “linked to the limited and rudimentary interaction of an earlier period, accommodationism was a more widespread and politically charged curriculum for the emerging late nineteenth and early twentieth-century racially segregated, industrial nation” (p. 324). More than any curriculum orientation, accommodationism is unmistakably linked with an imposed racial agenda (Watkins 1993). Often termed the “Hampton-Tuskegee” model, this curriculum emphasized “vocational training, physical/manual

labor, character building . . . and racial subservience” (Watkins 1993, 324). It was promoted by northern corporate interests (Watkins 1993, 2001). Accommodationism is associated with Booker T. Washington, whose famous 1895 speech to a mostly white audience in Atlanta offered a hospitable platform to corporate and other conservative interests (Anderson 1978, 1988; Harlan 1983; Watkins 1993). “Offering agricultural education, vocational training, and character building as centerpieces,” Watkins tells us, “this orientation is sharply distinguished from the liberal, progressive, and more militant outlooks” (p. 325). The accommodationist curriculum aimed for incremental black progress without militancy, and appeared to accept the notion of a “backward race” (Watkins 1993, 326). Directed especially at southern rural blacks, the model was later exported to Africa (Watkins 1993). Another proponent of accommodationism, Thomas Jesse Jones, was judged an “evil genius of the Negro race” by W. E. B. Dubois (Watkins 1993, 327). Watkins explains that “Jones was not only an important curriculum theoretician and ideologist, he was also corporate America’s point man in Black education” (p. 327). Linked with colonialism, segregation, and submission, accommodationism remained the educational and social policy of the South for decades (Watkins 1993).

Watkins indicates that liberal orientations were “more hopeful” and coincided with the optimism that in part characterized progressivism during the final decades of the nineteenth and the first decades of the twentieth century. The influence of missionary philanthropists is evident here. While not opposed to industrialization, they pressed for improved social conditions. During this period a number of black colleges were established, including Fisk University, Talladega College, Morehouse College, Shaw University, and others. Watkins (1993) tells us that while “not unaffected by the racial and paternalistic attitudes of their times, the missionary community derived a liberal education curriculum that borrowed from the traditions of humanism, such as altruism, free expression, and the unfettered intellectual development of the individual” (p. 328). He continues:

Black liberal education differed little from traditional liberal thought. A clear connection to Deweyan themes is evident. The curriculum was

designed to develop the students' analytical and critical faculties, and to help students become worldly, tolerant, and capable of significant societal participation. Black liberal education placed much significance on leadership. It strove to educate teachers, preachers, civil servants, and others who would be committed to the ideals of the liberal democratic state; these ideals encompassed gradual change, electoral politics, and planned societal transformation. (Watkins 1993, 328–29)

The liberal faith in progress and change has not been shared by nationalists and separatists, whose views first appeared at the end of the eighteenth century. Nationalist and separatist “views were linked to international slavery, colonization, the debasement of Africa, and the mistreatment of African peoples scattered throughout the world” (Watkins 1993, 329). Important twentieth-century nationalists and separatists included Marcus Garvey, Noble Drew Ali, Elijah Muhammed, and Malcolm X. Pan-Africanists such as Bishop Turner and Marcus Garvey supported return to Africa, whereas others believed cultural revitalization could occur only where Africans had been transported, such as the United States (Watkins 1993). Separatists such as Black Muslims, Malcolm X, and the Republic of New Africa shared certain views with Pan-Africanists and Black Nationalists. Separatists call for the establishment of a parallel society. Watkins (1993) reports that the separatist platform of the Nation of Islam advocated a program of black-owned businesses, a separate black educational system modeled after the University of Islam, and an end to black participation in American electoral politics, all of which is aimed at cultural revitalization and independence. The black studies curriculum movement of the past twenty-five years represents one programmatic expression of the nationalist orientation (Watkins 1993).

Afrocentrism reclaims the significance of Africa not only in the history of African Americans, but also in the history of the world. Ancient Egyptian civilization has become an important reference point (Asante 1987; Watkins 1993). Included in this remembrance of the African contribution is a reconsideration of Anglo-American epistemological theories as the only appropriate models of inquiry: “Eurocentric analysis is viewed as linear. Rooted in

empiricism, rationalism, scientific method, and positivism, its aim is prediction and control. . . . African epistemology, on the other hand, is circular (Asante 1987) and seeks interpretation, expression, and understanding without preoccupation with verification” (Watkins 1993, 331).

Afrocentrics such as Asa Hilliard et al. (1990) identify six areas in which the Eurocentric curriculum has failed: (1) the history of Africa before the slave trade is omitted; (2) the history of the people of the African diaspora (including, for instance, Fiji, the Philippines, Dravidian India) are ignored; (3) cultural differences rather than similarities among Africans in the diaspora are underlined; (4) the struggle against racism is insufficiently communicated; (5) analyses of the global systems of racial oppression are undertaught; and (6) the history of the peoples of Africa is omitted (Watkins 1993, 332–33). Other Afrocentrics assert that African ways of knowing must be communicated, and devaluations of blacks implied by bureaucratic designations like “at-risk” must cease (Watkins 1993). Additionally, Afrocentrics promote the teaching of the work of lesser-known African-oriented scholars such as Cheikh Anta Diop, Yosef ben Jochannan, Chancellor Williams, J. A. Rogers, Water Rodney, Eric Williams, and others (Watkins 1993, 332).

Watkins (1993) explains that while “Afrocentrics are very provocative, in general they don’t challenge the contemporary or historic economic arrangements of society” (p. 332), or the agenda of social reconstructionists (see Pinar et al. 1995; Stanley 1992). One of the major progressives and social reconstructionists, Harold Rugg, expressed interest in black educational issues (Rugg and Withers 1955, 264–80; Watkins 1993, n. 14, 333). Additionally, Watkins (1993) tells us, the platform of social reconstructionism, that is, “the ideals of a collectivist, egalitarian, reformed society found some support among the politically conscious Black intelligentsia” (p. 333). Further, black radicals during the 1930s and 1940s such as A. Phillip Randolph (founder of the Sleeping Car Porters Union) and Angelo Hearndon (active in southern sharecroppers unionization movements) were very much concerned with educational issues in ways consistent with the social reconstructionists (Watkins 1993, 333). Despite the absence of formal ties between social reconstructionists and black intellectuals and radicals, an ideological affinity is unmistakable. W. E. B.

Du Bois, “the pre-eminent twentieth-century Black educator” (Watkins 1993, 333), advocated views indistinguishable from those of social reconstructionists such as Rugg and Counts. Indeed, in an earlier essay, Watkins characterized Du Bois as a “black social reconstructionist” (Watkins 1993).

Cameron McCarthy (1993a, 1993b) views multiculturalism as representing a “curricular truce” between liberals and black radicals. For McCarthy, multiculturalism absorbed that black activism aimed at restructuring schools, re-expressing activism as so-called nonracism. Multicultural education represents an effort to acknowledge cultural diversity in the curriculum. Despite its noble intentions, it is problematical. McCarthy (1993a) characterizes multicultural education as a “contradictory and problematic ‘solution’ to racial inequality in schooling” (p. 225). McCarthy reviews the history of multicultural education, beginning with its assimilationist antecedents during the 1950s and 1960s.

Multiculturalism, McCarthy tells us, was replaced by a so-called pluralist model that advocated cultural diversity. Multiculturalism, in McCarthy’s words, “disarticulated elements of Black radical demands for restructuring of school knowledge and rearticulated these elements into more reformist professional discourses around issues of minority failure, cultural characteristics, and language proficiency” (1993a, 228). Multicultural proponents emphasize: (1) cultural understanding, (2) cultural competence, and (3) cultural emancipation.

We are what we know. Linking knowledge and identity, Louis A. Castenell Jr. and William F. Pinar (1993) argued that Americans are also what they do not know. If what Americans know about themselves—American history, American culture, the American national identity—is deformed by absences, denials, and incompleteness, then the American identity, both as individuals and as Americans, is fragmented. A fragmented self, they argued, represents a repressed self. Such a self lacks full access both to itself and the world. Repressed, the self’s capacity for intelligence, for informed action, even for simple functional competence is impaired. Its sense of history, gender, and politics is incomplete and distorted. Denied individual biography and collective history, African Americans have been made political appendages to European Americans.

Linking debates regarding the “canon” with questions of self, identity, and difference enlarges the curricular debate from an exclusive preoccupation with equity or with multiculturalism to include debates regarding the relationship between knowledge and ourselves (see McCarthy 1988b). In this regard, the “Eurocentric” character of school curriculum functions not only to deny role models to non-European-American students, it denies self-understanding to white students as well. The American identity is not exclusively or even primarily European American. Fundamentally, it is African American. For this point Castenell and Pinar refer not only to well-publicized demographic trends (minorities are predicted to constitute the majority perhaps by midpoint in the twenty-first century); they refer to the American past and the present. Although still unacknowledged by European Americans to an extent, they observe, the American nation was built by African Americans. African Americans’ presence informs every element of American life. The concept of “white” is predicated upon an excluded, racialized “other.” For European-American students to understand who they are, they must understand that their existence is predicated upon, interrelated to, and constituted in fundamental ways by African Americans (Goldberg 1990).

The American self denied and repressed, Castenell and Pinar argued, “acts out” repression via imperialism in foreign policy and political, economic, and cultural repression domestically. The refusal—sometimes unconscious, sometimes not—to incorporate African American knowledge into the mainstream curriculum is a psychoanalytic as well as a political process of repression. Understanding curriculum as racial text suggests understanding education as a form of social psychoanalysis (Kincheloe and Pinar 1991). The school curriculum communicates that which we choose to remember about our past and that which we choose to believe about the present. It also might elicit what we have forgotten, and in so doing might crack the walls of repression and allow a more accurate memory of the past to surface. Understanding the past accurately might allow us then to grasp the present. How do representations of race and difference communicate a sense of the American identity? The American identity is constructed partly by denial, by maintaining fictions. The

American “self” is not exclusively or even primarily European. That delusion represents a fantasy, a flight from historical and cultural reality (Castenell and Pinar 1993).

Beverly Gordon (1993) focused on African American cultural knowledge, “because it is born out of the African-American community’s historic common struggle and resistance against the various oppressive effects of capitalism and racism” (p. 265). In her “Toward Emancipation in Citizenship Education: The Case of African-American Cultural Knowledge,” Gordon provided an abbreviated history of this knowledge. She suggested that:

a major shortcoming of the African-American intelligentsia . . . has been their failure to take the work . . . [of] Booker T. Washington, W. E. B. DuBois, Kelly Miller, Carter G. Woodson, and William T. Fontaine . . . [and] synthesize it into a body of knowledge and to make it the basis of a common intellectual heritage that would give leadership and direction to the African-American community. (pp. 275–76)

African American scholars, she continued, must return to this legacy, to the whole of African American traditions, history, and cultural thought and construct an African American mode of rationality independent of Western European domination. African American knowledge needs to be synthesized in what she terms an “African-American epistemology” (Gordon 1993, 275–76).

Americans are multicultural, multiclassed, and multigendered. Despite this fundamental truth, various elements in the American national character continue to be devalued, indeed repressed. Toni Morrison (1992) made this point vividly: “certain absences are so stressed, so ornate, so planned, they call attention to themselves; arrest us with intentionality and purpose, like neighborhoods that are defined by the population held away from them” (p. 11). Not only the politically repressed suffer—although surely their suffering is the greatest, the most intolerable (Castenell and Pinar 1993).

European Americans “suffer” as well. Aware or unaware that they are racialized creatures, that their knowledge is racialized knowledge, indeed that their material and cultural wealth is in significant measure the product of “others,” especially African

Americans, European Americans forget history and politics—and themselves (Castenell and Pinar 1993). They cannot grasp that they “have been shaped and transformed by the presence of the marginalized” (Carby 1989, 39).

What does understanding curriculum as a racial text imply for African American scholars? Cornel West suggested that:

Black cultural workers must constitute and sustain discursive formations and institutional networks that deconstruct earlier Black strategies for identity formation, demystify power relations that incorporate class, patriarchal, and homophobic biases, and construct more multivalent and multidimensional responses that articulate the complexity and diversity of black practices in the modern and postmodern world. (West 1990, 105)

In West’s statement we see clearly how poststructuralist categories—such as deconstruction—can inform racial theory and produce political strategy.

In whiteness studies, in historical studies, in anti-racist education, the centrality of race in contemporary curriculum studies is obvious (see Crocco, Munro, and Weiler 1999; Lomotey and Rivers 1998; Feagin and Hernan 1995; Frankenberg 1993, 1997; Kincheloe, Steinberg, Rodriguez, and Chennault 1998; Pinar 2001, 2004; Watkins 2001).

William F. Pinar

CURRICULUM AND GENDER

Since its beginnings, organized schooling in the United States and the national conversation on education have been concerned with gender, although the scholarly appreciation of this historical fact is rather recent. In other words, schooling and the discourses on schooling have been informed historically by the meanings we have given to the division of human beings into male and female (Tyack and Hansot 1990) and to those attitudes and discourses that prompt us to divide the world according to biological and hormonal differences we mark as sexual (Butler 1990). Concerns with gender have taken many forms in curriculum studies, from questions

regarding the value of coeducation to debates regarding the differences and similarities between females and males; from criticism of institutional sexism and heterosexism to analyses of the way gender permeates our concepts of knowledge and our ways of knowing (see Pinar et al. 1995).

To understand curriculum as gendered is to investigate the relationships between curriculum and gender. It is to subject the curriculum and its discourses to feminist analysis, radical homosexual or gay analysis (or queer theory; see Doty 1993; Pinar 1998), and gender analysis (this last phrase subsuming the first two), all concerned with the unequal ways people are regarded due to their gender and sexuality, and the ways we construct and are constructed by the prevailing system of gender and sexuality (Pinar et al. 1995).

In the 1970s radical feminist critics critiqued the reality interpreted by men in institutions of higher learning. These descriptions of reality had been compartmentalized into disciplines and claimed objectivity. During the 1970s each of the academic disciplines came under scrutiny by feminist critics (e.g., Daly 1973, 1978; Rubin 1975). Several conclusions were reached: (1) the research methodologies of these disciplines were found to prevent certain kinds of information; (2) whole areas of inquiry related to women continued to be overlooked or trivialized; (3) generalizations about both sexes were made based on the study of men only; (4) research itself, while claiming objectivity, was revealed to be value-laden; (5) knowledge was seen to be treated as something external to human consciousness; (6) the difficulty of introducing new ideas was exacerbated because extant knowledge and modes of inquiry produced knowledge consonant with what was already accepted and with the methodology itself; (7) knowledge was revealed as knowledge of men, not of human beings; (8) women were devalued in all the disciplines; and (9) a dualistic perspective, highly rational and technological, was revealed to guide much research (Pinar et al. 1995).

Partially in response to these findings but also created as an alternative to the hegemony of patriarchy in institutions of higher learning, women's studies programs first appeared in the 1970s. These programs attempted, in part, to redefine and reconstruct the academic disciplines. According to Peggy McIntosh (1986), Director of the Wellesley College Center for

Research on Women, during the 1970s more than one hundred projects investigated the redesign of the academic disciplines. In the 1980s, an interest in curricular change through women's studies was articulated by McIntosh (1986), and Mary Kay Tetreault (1985). These approaches to curriculum reformation began in the 1970s as an ordering of stages through which disciplines would pass and as a conscious attempt, as Kay Boals (1976) wrote, to "demystify the dominant other" and "remythologize one's own tradition" (p. 199).

Stage theory was exemplified by McIntosh's (1986) analysis of phases in curriculum change in history. Stage one, she said, is "womanless history." Stage two is "women in history" where women exist as exceptions. Stage three is "woman as problem" in history. Here the barriers and structures that have kept women out of history are examined. Stage four is "women's lives as history" in which pedagogical methods become less hierarchical and the construction of knowledge through the lens of gender is investigated. Stage five is a radical transformation based on holism and affiliative modes of knowing and relating.

Psychoanalysis, phenomenology, autobiography, and political and feminist theory inform the work of Madeleine R. Grumet (1988). Grumet postulates the "look" as one way to emphasize the intersubjectivity of the human world, "a direct passage between persons" (p. 96). "That is not to say," she writes, "that our minds created the world but that the world we know is the one we share with others" (p. 95). The genesis of knowing resides in intersubjectivity and, specifically, in the primordial relationship of infant and mother. While parenting and pedagogy are not isomorphic, Grumet believes that each affects the other. For both, the look is an index of the complex of relations that prevail in both parenting and pedagogy. Grumet explains that the look of parenting and pedagogy, however, differs.

Grumet tells us that the look of parenting includes touch; it recalls the symbiosis of the infant-mother relationship and the tactile quality of that relationship. The look of teaching rejects touch. Grumet notes that the teacher is "untouchable" (p. 111), apart from the student, invulnerable. Further, the intersubjective character of the classroom is disguised by the traditional seating pattern of rows. Grumet writes: "By arranging students in rows, all eyes facing front, directly confronting the back of a fellow's

head, meeting the gaze only of the teacher, the discipline of the contemporary classroom deploys the look as a strategy of domination" (1988, 111).

The gaze of the teacher is often impersonal and determining, just as is the look of her supervisor, ordinarily a male administrator who, for the sake of evaluating her teaching, "observes" her. Women came to classrooms as victims of the look, pornography being the most obvious. Is teaching an avoidance of the look? "Dreading the objectification of the look, prohibited from extending touch, the female teacher turns to talk to assert her subjectivity" (p. 113). While the predominance of teacher talk in classrooms is most readily traceable to traditions of Greek rhetoric and Christian liturgy, it is also traceable to the psychodynamics of the look. In such a view, (female) teacher talk represents the "sending out of waves of words to ward off the look that surges toward us in the stillness of the silent classroom" (p. 113). In this regard, avoidance of the gaze of male students may help account for the female teacher's tendency to call on boys more frequently than on girls. For Grumet (1988), the look expresses the subjectivity and specificity of a particular relationship (as in a parent-child relationship), while the gaze appears objectifying and impersonal.

Parenting permits reciprocity because it occurs over time. Grumet writes: "The history of the parent/child relation is one of exchanged glances. The child will walk many miles and make many visits to understand the look under which he has stood" (1988, 116). The adult returns to his or her parents repeatedly, in part to study again the gaze under which he or she has come of age. And in old age, as the bodily decline reverses the relations of dependency, "the adult who was once the child is now the overseer within whose gaze the aged parent sees his former power and possibility" (p. 116). Denied such duration and intimacy, pedagogy precludes reciprocity. Further, for those teachers who regard the curriculum as prohibition, as denying access to the world as lived, as intersubjective, the look is bloodless. Grumet concludes: "When curriculum is alive, it invites the student to reappropriate it as she reclaims her identity from its origin in her parents' look, grasping and dislodging and reclaiming its perspective. When the curriculum is a dead sign, all of us, teachers and students, stumble under its empty stare" (116).

Grumet explains that transference—a psychoana-

lytic concept which refers to the reproduction of past emotional patterns in present relationships—denotes the displacement of original, often traumatic feelings that are transferred from those first associated with them to the psychoanalyst. One of the projects of psychoanalysis is the disclosure and analysis of the transference relationship, permitting the analysand (or patient) to travel back to possibly blocked, repressed experience. Grumet extends the concept of transference beyond psychotherapy to the relationship between student and teacher. Speaking of teachers Grumet writes: "We expect them to know and, in that knowing, to confer knowledge and power on us" (1988, 122). This expectation to know derives from original dependence upon the parent, usually the mother, and becomes transferred to teachers. However, the medium of dependence—language—is the symbolic order, associated with the father. Grumet draws upon Jacques Lacan's (1997) assertion that language is always the "other" and that at the basis of self-formation is an estrangement—the other, a "not-self." Grumet notes: "The language of the other is the basis of the self, and the desire for the other is always a desire to appropriate that power and to undo the alienation that is the basis of ego identity. . . . We enter the symbolic order in an action of desire that can never be fully gratified" (p. 125).

Because language—the symbolic order—cannot ever restore the sense of self apart from other, "all symbolic activity," Grumet explains, "is motivated and outstripped by desire" (1988, 125). She continues: "Now we have arrived back in the classroom, facing front, eyes on the instructor. What funds our attention is hope. We expect to grow into a self within his look. But we always suspect that he is actually looking not at us but at another whom we do not know but who is finally more powerful and compelling than we" (p. 125).

Traditional teaching, because it tends to focus primarily, sometimes exclusively, upon the curriculum as object, curriculum as textbook, focuses on the symbolic, phallic order created by men, rather than the concrete, embodied world of children created by women. Traditional teaching assumes that the student's understanding is misguided and inadequate; rarely is the student's reading the subject of classroom discourse. Indeed, it is the lived experience of students—linked as it is to the text, mediated and expressed through language—that is missing from

the traditional classroom. Of traditional teachers Grumet writes: "For the first time I understand that when they are ripping me off they themselves are struggling to recover their losses. Must we perpetuate this economy? Must we observe the golden rule of pedagogy and withhold from others what has been withheld from us?" (1988, 128)

If teaching carries with it the teacher's as well as the students' transferences, we must become aware of the original look under whose gaze we first came to form an identity. To learn to teach, then, requires studying the transferences operative in classrooms. Grumet advises that we "build our pedagogies not only around our feeling for what we know but also around our knowledge of why and how we have come to feel the way we do about what we teach. Then, perhaps, teaching the text may lead us to devise new forms of knowing that will not compel our students to recite the history and future of our desire" (1988, 128).

"Curriculum," Grumet asserts, "is our attempt to claim and realize self-determination by constructing worlds for our children that repudiate the constraints that we understand to have limited us" (1988, 169). A yearning for affiliation has become associated with weakness and with the family, especially with women. As Grumet argues in her gender history of American public schools, women embraced the public world, the symbolic order, as a defense against the constraining, enforced intimacy of the nuclear family. Indeed, the public world becomes embraced more adamantly to forget how much we miss the intimacy of the mother-child bond. Referring to the feminist political theory of Jean Elshtain (1981), Grumet explains:

The history of political thought stresses this repudiation of the essential connections within which our humanity evolves: The male repudiates those feelings and actions that he associates with femininity in order to achieve maleness; the female repudiates her mother in order to participate in the public world. Politics repudiates the family. Ethics repudiates the experience of the body, of particular persons, and of intimacy as it strives to construct a logical argument to support autonomy and differentiation. (1988, 170)

Parents have been, in general, excluded from curriculum decisionmaking, an exclusion justified on the

grounds that their interests are too parochial and self-interested. The vision of a "common culture" has been somehow a vision bleached of particularity, including the specificity of ethnicity and family. Somehow that which we experience and live in our everyday lives is not "common." Indeed, "common culture" always implies a rejection of contemporary life. Grumet notes: "Because the common culture is always anywhere other than this world, its curriculum rarely speaks to a world children know, a world accessible to their understanding and action. It is a curriculum that controls through mystification, encouraging placid passivity. . . . Power wears many masks, and if in some countries it appears as the Church or the Party, or even the People; here it is the Common Culture" (1988, 171-72).

In the common culture our children become "other people's children." They lose the intimacy and specificity that characterize the parent-child bond in the name of the meritocracy; they gain anonymous labels such as "gifted" or "disadvantaged," bureaucratic designations designed to transport our flesh and blood into a bloodless public sphere: "Few of us would excuse our own children from their futures with the grace and understanding we extend to other people's children. Other people's children are abstract. They are reading scores, full-time equivalencies (FTEs), last year's graduating class, last week's body count" (1988, 173).

A curriculum for one's own child, Grumet observes, would be a conversation in which our son's and/or daughter's response is a necessary, welcomed, and prominent feature. Curriculum decisions for one's own children involve parents' and children's participation. Parents and children would join teachers in the interpretation of educational experience, in making choices regarding "next steps." Such parental participation goes beyond the traditional politics of "local control"; such participation brings parents into the daily life of classrooms. Parental "participation would interrupt the march to the common culture without necessarily shifting the whole parade to another destination" (1988, 174).

Janet L. Miller's lyrical and powerful scholarship helped break the silence regarding gender in curriculum studies. In 1982 she reported the emerging discourse on gender and sexuality so that "feminist pedagogy and curriculum [may] . . . reciprocate, inform, and alter one another" (p. 5). Reviewing re-

cent work by Grumet, Pinar, Taubman, and Wallenstein to illustrate an “evolving feminist pedagogy” (p. 10), Miller noted that “breaking silence with my students creates a way for me to ground my fears of the unnatural silences and to focus my voice, my energies upon the articulation of our work together” (p. 10).

Perhaps more than any other major feminist theorist, Miller (2004) has focused upon “our work together.” This acknowledgement of the presence and conservation of others is expressed in her collaborative work with students, focused on issues of voice, community, and selfhood (1986, 1987). Of central concern have been the possibilities and the contradictions that emerged in feminists’ attempts to develop collaborative and dialogical relationships with their students and colleagues (1990). Her work during the 1980s underlined her observation early in the decade that “the sound of silence breaking is harsh, resonant, soft, battering, small, chaotic, furious, terrified, triumphant. The tentative first murmurs are becoming a chorus” (1982, 11).

In *Creating Spaces and Finding Voices*, Janet Miller’s (1990) emphasis included not only the quest to integrate the fragmented parts, the contradictions within the self, but also explorations of ways in which those fragmentations and contradictions reflect and frame social, cultural, and historical constructions, positionings, and representations of women and men, and their work as teachers, researchers, and curriculum creators. The emphasis in *Creating Spaces and Finding Voices* is less on forging a unified whole, either within collaborative communities or within individuals, and more on exploring the connections that are possible among those fragmentations and differences.

Following Grumet, Jo Anne Pagano warned against celebrating “the amorphous thoroughly individualized, subjective, male-romanticized, theatricalized version of the female” (Pagano 1988, 527). Rather, Pagano argued, there was no conflict between nurturance and authority, between paternal and maternal power. Authority, she continued, arose from the affiliation one had with one’s students, not from the law. The law provided paternal power, but it had to be worked through by women teachers, contradicted, and finally employed in the service of affiliation.

These important problems—women’s relationship

to their own intellectual development, the ambivalent relationships women and women teachers have to males and to patriarchy, the constitution of women’s authority in a world constituted by asymmetrical gender arrangements—were woven together in Pagano’s *Exiles and Communities: Teaching in the Patriarchal Wilderness* (1990). In that carefully reasoned work, Pagano argued that teaching was a morally charged and politically infused endeavor that for women was complicated by gender. Since, as she wrote, knowledge is power, and those who possess it are powerful and those who define what it is are the most powerful, teaching is inherently involved with questions of power.

Exiles and Communities addresses ethical questions of education, questions of knowledge and power, of authority and of the relationship between the individual and the community. It explores alternatives to those methods, assumptions, and goals that preserve male authority. Further, the book explores how women teachers can build communities in the wilderness, a wilderness that is androcentric, but it is also “symbolic of the powerful devouring mother” (1990, 9).

The most visible male scholar working to understand curriculum as gendered (and more particularly, as homosexual or gay) is James T. Sears (1990, 1992, 1997, 1998). While the most visible, Sears is not the only curriculum scholar interested in homosexual (or gay or queer) issues (see, for instance, Pinar 1998, 2001; Silin 1992, 1995; Tierney 1993a, 1993b; Britzman 1998a, 1998b, 1998c, 2000), but he is the key figure. He and other important scholars in this sector have participated in *Queer Theory in Education* (Pinar 1998), the first collection of its kind in the field of curriculum studies and in the broad field of education generally.

Sex education is an important curricular area where gender theory surfaces explicitly. One scholar of sex education programs has noted that “failure to recognize the social and historical dependency of sex allows for the reification of our conceptualizations of sex into objective elements of a fixed and socially independent human nature” (Diorio 1985, 246). One area, for instance, in which this essentialist view of sexuality surfaces is in literature on sex education and adolescent pregnancy (Diorio 1985). This area received book-length attention in *Sexuality and the Curriculum: The Politics and Practices of Sexuality*

Education, edited by James T. Sears (1992), which challenges mainstream sex education. What Pinar and Miller wrote in 1982 remains true today: “Feminist thought to date operates in relative isolation from other eddies of curriculum theory and practice, but its ripples will have profound . . . influence” (p. 222). Perhaps no other single discursive configuration in the field circulates these traditional concepts into a kaleidoscopic theoretical whole as effectively as that sector of scholarship that labors to understand curriculum as gendered.

William F. Pinar

CURRICULUM AND ITS INSTITUTIONALIZATION

Much curriculum scholarship is focused upon the school. Understanding curriculum as it is institutionalized suggests understanding curriculum as it functions bureaucratically (see Kliebard 1975b). Questions within this domain include: Does the curriculum work? How can it fit the institution? Can the curriculum enable the school to function more smoothly and efficiently? How do we measure success? Understanding curriculum as it is institutionalized is, fundamentally, an ameliorative approach linked explicitly to the everyday functioning of the institution (Kliebard 1970).

The point of curriculum development in the traditional field (1918–1969) was to make incremental improvements in the school as institution. In the present period, the focus of curriculum development, scholarship, and research has diversified somewhat. Now understanding has also become an issue. However, institutional maintenance or improvement remains a paramount reason for this genre (see Pinar et al. 1995).

This entry is organized around two general categories: curriculum development and teaching. Curriculum development as a general category is divided into the following domains: (1) curriculum policy and school reform, (2) curriculum planning, design, and organization, (3) curriculum implementation, (4) curriculum technology, (5) curriculum supervision, and (6) curriculum evaluation. Included in the sec-

ond general category (that of teachers and teaching as they are related to curriculum) are (1) pedagogy and (2) textbooks. Concluding this entry are reports on two additional areas: curriculum and students, and the extra-curriculum.

These categories reflect institutional, bureaucratic concerns. Interests in life history, in politics, in the lived or phenomenological experience of those in schools are present but they are in service of institutional interests, that is, teacher development, preparing teachers, evaluating programs, and so on. Studies of ideas independent of institutional concerns, about profound human aspirations for meaning, excitement, and joy—while sometimes given a rhetorical acknowledgment—tend to be absent in the effort to understand curriculum institutionally (see Huebner 1999; Macdonald 1995; Pinar et al. 1995).

In their review of research on curriculum policy, Richard Elmore and Gary Sykes (1992) reported that such research “is anything but a well-organized, distinctive field of inquiry” (p. 185), characterizing the body of work on government involvement in curriculum as “loosely organized, both topically and conceptually” (p. 185). They identify three sources of policy research: (1) disciplinary research applied to curriculum, especially by the fields of sociology, history, and political science, (2) evaluation of government-sponsored interventions thought to be of curricular significance, and (3) that public-policy research which is focused on curriculum issues. Curriculum theory itself attends to policy issues, such as Whitson’s (1991) important study of Supreme Court cases affecting censorship and related curriculum issues.

Elmore and Sykes (1992) define curriculum policy “as the formal body of law and regulation that pertains to what should be taught in schools” (p. 186). Research on curriculum policy investigates how regulatory events occur, including what these events require of the curriculum. They note that policy often follows interventions rather than precedes them, as they would in a rational model. Indeed, policies often function as rationales for political interventions already made.

One important example of curriculum policy as instrumental action is the conservative agenda for school reform. Perhaps the opening volley was Adler’s *Paideia Proposal*, published in 1982, followed by *A Nation at Risk* in 1983 (National Commission on

Excellence in Education [NCEE]). These reports accused American schools of decline and a lack of vision, and teachers of incompetence. The sense of alarm came this time not from military competition, as in 1957 (see Pinar et al. 1995), but from economic competition with Japan and Germany (see Pinar et al. 1995). Soon to follow were conservative curriculum proposals by Allan Bloom (1987), E. D. Hirsch (1987, 1999), and Diane Ravitch (2000).

Conservatives attempt to rewrite the history of curriculum theory (see Hirsch 1999; Ravitch 2000). Herbert Kliebard (1986) observed that Hirsch misunderstands Dewey while reducing curriculum to a list of objectives or facts. Despite misunderstandings, the rhetoric of school reform has been dominated by conservatives, both in government and in education. In addition to a reassertion of a Eurocentric core curriculum in the universities was the notion that American elementary and secondary schools should be more like American business (Pinar 2004). Various business-school coalitions have been formed at national, state, and local levels. Illustrative of this view is Denis P. Doyle, Senior Research Fellow at the Hudson Institute, who asserted: "The only group in America that can bring this off successfully is the American business community. They are the stakeholders with the most to gain and the most to lose because of bad schools" (1991, 18).

From the right and left there is agreement on the need for significant change, or, in the jargon of the day, on "restructuring." Restructuring and decentralization both followed from effective schools research. Critical of this notion, and of the more general characterization of schools as a business, Pinar insists that linking the public school curriculum to test scores and then requiring teachers to engineer improvements in students' test scores amounts to a political maneuver that performs cultural authoritarianism for the ring-wing in the name of "accountability" and, presumably on behalf of "under-served" populations (Pinar 2004).

Curriculum decentralization has attracted international attention (Silva 1993). In 1993, decentralization was the subject of an international seminar sponsored by UNESCO in Santiago, Chile, and chaired by Juan Casassus. One of the most perceptive students of decentralization (and school reform generally), Hans Weiler (1993) argues that decentralization advocacy ordinarily takes the form of one

of three arguments: the redistribution argument, referring to the sharing of power; the efficiency argument, linked to a faith in the cost-effectiveness of the educational system through a more efficient deployment and management of resources; and a culture of learning argument, pointing to the decentralization of educational content.

The written curriculum policy presumably proceeds to the planning and design of the curriculum which, when implemented, will institutionalize the policy. While the history of curriculum design is long (see Short 1986, for an abbreviated history, and Kliebard 1975d for a sketch of the metaphorical roots of design), perhaps the best-known traditional view of curriculum planning and design is that of J. Galen Saylor, William Alexander, and Arthur Lewis (1981), although the topic is venerable enough to have engaged scholars whose work functioned to reconceptualize traditional categories (Macdonald and Purpel 1987).

For Saylor, Alexander, and Lewis, the planning and design process is a rational, orderly, and bureaucratic one. As indicated in the table of contents to their *Curriculum Planning for Better Teaching and Learning* (1981), it includes attention to processes and roles, to collecting data, and translating these into goals and objectives. After establishing goals, curriculum planners then select an appropriate curriculum design.

Saylor, Alexander, and Lewis (1981, 206) explain how each curriculum design privileges a certain order of goal, from learning the school subjects and academic disciplines in design number one, to cultivating individual interests, a design we might associate with the child-centered wing of the progressive education movement (see Pinar et al. 1995). As they point out, no one design is educationally comprehensive. That is to be expected, given the "two contradictory tendencies—specialization and integration" (Vars 1982, 215; see also Smith, Stanley, and Shores 1957).

Curriculum design has also been articulated as a consequence of theory. Kieran Egan's (1990) elaborate and sophisticated curriculum design for middle-school-aged students is based on "romantic understanding" and expresses Egan's view that stories represent the substance of education (Egan 1986). Another thoughtful, theory-inspired curriculum design is entitled *The Challenge to Care in Schools: An Alternative Approach to Education*, written by Nel

Noddings (1992), whose feminist theory has been influential (see Pinar et al. 1995). In this volume Noddings makes a significant contribution to the concept of curriculum design. She begins by distinguishing her view from the dominant design emphasis upon the academic disciplines. She explains:

My argument against liberal education is not a complaint against literature, history, physical science, mathematics, or any other subject. It is an argument, first, against an ideology of control that forces all students to study a particular, narrowly prescribed curriculum devoid of content they might really care about. Second, it is an argument in favor of greater respect for a wonderful range of human capacities now largely ignored in schools. Third, it is an argument against the persistent undervaluing of skills, attitudes, and capacities traditionally associated with women. (1992, xii)

In an important review of research on curriculum implementation, Jon Snyder, Frances Bolin, and Karen Zumwalt (1992) list three major approaches. The first, possibly the most common, is termed the “fidelity perspective,” by which they mean a focus on “measuring the degree to which a particular innovation is implemented as planned and identifying the factors which facilitate or hinder implementation as planned” (p. 404). The assumption here is that successful curriculum implementation is characterized by fidelity to the original plan. This is the traditional conception of curriculum implementation (for alternatives, see Carson 1984). For example, traditionalist Mauritz Johnson (1974) had elaborated “a PIE technical model: planning, implementation, evaluation” (p. 375).

Michael Fullan (1985) has elaborated what is necessary for change to occur at the individual level. While some of the following characteristics overlap with the previous list of general factors affecting implementation, these focus upon the process of individual teachers changing their thinking, a view that Anne Bussis, Edward Chittenden, and Marianne Amarel (1976) would seem to agree is essential to successful curriculum implementation.

CURRICULUM AND TECHNOLOGY

The Greek word for technology is *techne*, translated as art, craft, or skill. Plato regarded *techne* and

episteme (translated as systematic or scientific knowledge) as closely related. For Aristotle, *techne* was the systematic use of knowledge for intelligent human action. Broadly understood, then, technology refers to any system of practical knowledge; it is not restricted to hardware. A more contemporary definition of technology by Donald Ely is: “any systematized practical knowledge, based on experimentation and/or scientific theory, which enhances the capacity of society to produce goods and services, and which is embodied in productive skills, organization, or machinery” (see Bull 2002).

Technology has influenced curriculum and especially instructional design. The development and employment of hardware has been secondary to the employment of technological schemes for instruction and learning. Behavioral psychology epitomized this technological view of education in the 1960s, but it was soon eclipsed by Piagetian developmental psychology in the 1970s, which was then eclipsed by cognitive psychology and cognitive science. In this latter formulation, the emphasis upon behavior and developmental stages, evident in the behavioral and Piagetian approaches, was replaced with an emphasis upon the “organization, processing, and storage of information by the learner. . . . From the cognitive view, educational technology should be focused on activating the appropriate learning strategies during the instructional process rather than merely initiating behavioral responses” (Saettler 1990, 14). Carl Bereiter and Marlene Scardamalia (1992) note that, contrary to common belief, cognitive scientists do not believe that the computer is an adequate model of the mind.

For a comprehensive (if now somewhat dated) history of educational technology see, for example, Paul Saettler’s *The Evolution of American Educational Technology* (1990). From this study, it is clear that educators’ interest in computers and their curricular possibilities has been unwavering. However, several thoughtful observers of the scene have expressed concern for what can seem an excessive enthusiasm for computers. For instance, Douglas Sloan (1985) has noted that the current wave of enthusiasm for the use of computers in the schools is uncritical. C. A. Bowers (1993, 1995, 2000) has been concerned that human experience may be distorted to coincide with computer capability, rather than computers being employed to extend and enlarge

human intelligence and capability. Bowers (1993) notes that insofar as computers embody the conceptual framework (and by consequence the ideology) of these experts who devise them, the technology itself can be viewed as reproducing a specific ideological orientation. Further, Bowers believes that this ideology is based on fundamental misconceptions regarding the nature of the individual, the nature of knowing (including intelligence) and, more specifically, how individual empowerment relates to social progress.

"This myth," C. A. Bowers (1995, 4) asserts, "is predicated on an anthropocentric view of the universe and the further assumption that our rationally based technology will always enable us to overcome the breakdowns and shortages connected with the natural world." More specifically, Bowers (1995, 12) argues, "the cultural orientations amplified through educational computing are the very same cultural orientations that have contributed to destroying the environment in the name of progress."

In *Let Them Eat Data*, Bowers (2000, 22) questions "whether computers lead us to substitute decontextualized ways of thinking about the world for the sensory encounters with the natural world that intertwine our lives." Bowers criticizes those who naively accept "Western myths that represent change as linear, progressive, and evolutionary" (Bowers 2000, 8). Many would suggest that he overstates his case when he asserts, "the inescapable reality is that computerization commodifies whatever activities fall under its domain" (2000, 8).

Few would agree that commodification can be ascribed causally only or even primarily to "computerization." In terms of the struggle for ecological sustainability, computers might, in fact, be helpful, at least in the dissemination of information regarding the crisis. While "computers provide us a window (information) for recognizing the early warning signs of over stressed ecosystems," Bowers allows (1995, 13) "they also mesmerize us into thinking this is the primary form of knowledge we need for correcting the problem."

Perhaps, but it seems also true that in the conceptualization of the "biosphere" (Bowers 1995, 1) individuality (not "individualism," its parody) disappears, as historian Christopher Lasch (1984, 19) suggests: "The minimal or narcissistic self is, above all, a self uncertain of its own outlines, longing ei-

ther to remake the world in its own image or to merge into its environment in blissful union." Bowers acknowledges "the breakdown in the distinction between our private and public lives," but appears to reinscribe this immobilizing state of affairs in his embrace of "the biosphere" (2000, 58).

Bowers' (2000, 12) strongest point is that "our ecological crisis is essentially a crisis of cultural beliefs and values," and, as such, it is a problem, in part, of education." It is culture—in our context, American culture—that must be reconstructed. While Bowers sees little reason for hope in the institution of schooling at any level (because it remains embedded in capitalism and Enlightenment mythology [see Bowers 2000, 56]), schooling remains the only official site of public instruction.

Bowers is alarmed that computers represent the lynchpin in the cultural crisis that threatens to destroy the very conditions of sustainability of the species. He summarizes these conditions:

The subjectivity of cyberspace expresses all the attributes of the individualism of the Industrial Revolution: a natural attitude toward being a rational, self-determining individual who looks on both past and present in terms of immediate self-interest; a view of the environment as a technological and economic opportunity; an expectation that change leads to a personal enlargement of material well-being; and a view of the world's other cultures as evolving toward the rootless individualism that can easily adapt to the rapidly changing routines of technologically intensive modes of production. (Bowers 2000, 41, 106)

Others would suggest that cyberspace reconfigures subjectivity, dispersing the cult of individualism, rendering rationality sensate, even unrecognizable in its modernist manifestations (see Pinar 2004). The commodification of the natural environment, the obsession with material self-advancement, and cultural imperialism are hardly new and, as Pierre Lévy's (2000) reverie suggests, cyberspace may well prove not altogether hospitable.

Bowers' expression of skepticism toward the current obsession—he terms it "addiction" (see 2000, 177)—with computers in schools, with what, in a different context, Christopher Lasch (1978, 217) termed a "grandiose vision of a technological uto-

pia" is strong. Likewise, Ted Aoki [Pinar and Irwin, in press] speaks of our "intoxication" with technology and science. Historian Christopher Lasch (1984, 33) worried that: "By holding out a vision of limitless technological possibilities—space travel, biological engineering, mass destruction—it removes the last obstacle to wishful thinking. It brings reality into conformity with our dreams, or rather with our nightmares."

Whatever its complex consequence will be, clearly an explosion in technology applications for the classroom and in technology education has occurred. Saettler (1990) situates this development historically. The excitement over computers in the classrooms followed like "explosions" of interest in the curricular possibilities of educational radio, film, slides, and television. The use of computers in classrooms offers many possibilities and raises many questions. Some have regarded technology as a rescue from the "ingrown, closed system" of curriculum theory (Pratt 1978, 149). Perhaps Peter J. Fensham (1992) summarized best the current state of the technology education: "Technology education as a component of the curriculum in its own right is far too new for its major influences to be identified in any adequate way. . . . The situation with technology education at the moment is still very fluid" (p. 815).

SUPERVISION, EVALUATION, AND CURRICULUM

The evolving relationship between supervision and curriculum has been established in several synoptic textbooks, including such works as *Emerging Patterns of Supervision: Human Perspectives* (Sergiovanni and Starratt 1971), *Supervision for Improved Instruction* (Lewis and Miel 1972), *Supervision in Education: Problems and Practices* (Tanner and Tanner 1987), *Supervision for Today's Schools* (Oliva 1989), and *The Central Office Supervisor of Curriculum and Instruction: Setting the Stage for Success* (Pajak 1989). As Dianne Common and Peter Grimmett (1992) have observed: "The relationship between curriculum and supervision is a fragile one; its negotiation can proceed from the exercise of legal-rational authority and procedural correctness, or it can proceed through mutual reflection and reconstruction. The former leads to estrangement, the latter to rapprochement. The choice is ours, researchers and practitioners alike" (p. 225).

Influential in curriculum development, supervision has been an integral part of curriculum study for decades. For example, an emphasis on the leadership role of the supervisor in guiding curricular practices is found in *Supervision: A Guide to Practice* (Wiles and Bondi 1980). The 1992 Association for Supervision and Curriculum Development (ASCD) Yearbook, entitled *Supervision in Transition* (Glickman 1992), insists that educational leadership and supervision must be shared, decentralized, and empowering for teachers in order to be effective. Contributors to the yearbook promote peer coaching, teacher mentors, collegial support, and peer assistance models of supervision with explicit suggestions for teachers to assume decisionmaking leadership roles.

Perhaps no scholar has considered more carefully the significance of hermeneutics for supervision than Noreen Garman (1990). Relying on Edmund Husserl and Paul Ricoeur, Garman has outlined the "embedded theories in the taken-for-granted events of clinical supervision" (1990, 212). She points to the need for a language for teaching in order to "articulate supervisory practice" (p. 212). Much of contemporary supervisory practice, she notes, "is now tailored to meet administrative convenience and is couched in 'scientism' rather than sound supervisory practice based on moral justification" (p. 212). Garman's hermeneutic approach requires a suspension of the administrative interest for the sake of "generating hermeneutic knowledge" (p. 212).

Since the 1960s, George F. Madaus and Thomas Kellaghan (1992) tell us, curriculum evaluation has experienced enormous growth, as has assessment in school classrooms. Evaluation, like all major terms in the curriculum field, enjoys multiple definitions (Madaus, Scriven, and Stufflebeam 1983; Murphy and Torrance 1987; Worthen and Sanders 1987; English 1988; Weiss 1989), but Madaus and Kellaghan report that it is Ralph Tyler's definition of 1949 that has enjoyed "considerable influence" (1992, 120): "The process of evaluation is essentially the process of determining to what extent the educational objectives are actually being realized by the program of curriculum and instruction" (Tyler 1949, 105–6; Madaus and Kellaghan 1992, 120). Dissatisfaction with the Tylerian definition led, in the 1970s, to a variety of evaluation approaches. Indeed, the 1981 Joint Committee on Standards for Educational

Evaluation defined evaluation broadly as “the systematic investigation of the worth or merit of some object (program, project, or materials)” (p. 12). Evaluation is the broad category while assessment is subsumed within it. Within assessment is measurement, the most narrow form or subset of evaluation.

Despite the variety of approaches to evaluation, the term has become increasingly important in political debates regarding the progress of education in the United States and worldwide (see Pinar et al. 1995; Fuhrman and Malen 1991). The term “educational indicator” (developed to parallel existing terms such as “economic indicators” and “social indicators”) has been employed to summarize the current conditions of the educational system nationwide (Johnstone 1981; Oakes 1985). Presumably, weaknesses and progress in student achievement in individual subject areas are detected and reported. Such evaluation reports can be expected to become even more important as national political pressure builds to increase test scores of American students (Madaus and Kellaghan 1992). Specific information regarding student achievement, as measured by standardized examinations, is housed in the National Center for Education Statistics. Such data are increasingly employed by politicians who use measures of educational decline or progress to advance their own agendas (Pinar 2004).

Evaluation in general and testing in particular accompanied the social efficiency movement of the 1920s (Pinar et al. 1995). Many school systems began to make surveys of rates of expenditure, drop-out rates, promotion rates, and tests of achievement in the various basic skill areas, such as arithmetic, spelling, and writing (Madaus and Stufflebeam 1984). Such tests functioned also as curriculum evaluation, although during the 1920s a shift occurred, one from employing tests to evaluate curricula to employing tests to assess teachers and school systems as a whole (Madaus and Kellaghan 1992). Another shift occurred a decade later, as tests were employed primarily to make assessments of the progress of individual students, for purposes including the assignment of grades, diagnosis of learning problems, and tracking (Cronbach 1983). Following World War II, standardized tests became more available and more frequently used to measure student progress. Also during this period, Tyler popularized the notion and practice of objectives (Tyler 1949). In the postwar period, taxonomies were developed, designed to assist educa-

tors in the writing of objectives (Bloom 1956; Krathwohl, Bloom, and Masia 1964). While the Tyler rationale for curriculum development advanced a triangle of educational concerns—objectives, learning experiences, evaluation—by the 1960s it became a rationale for test development (Madaus and Kellaghan 1992). While Tyler regarded evaluation as derived from curricular objectives, by the 1960s many considered that it was the test itself that came to determine the curriculum (Travers 1983). Under the Bush administration, teaching to the test has, in effect, become the law (Pinar 2004).

While historical antecedents are important, and particularly the seminal influence of Tyler’s rationale (see Walberg 1970), contemporary curriculum evaluation is sometimes dated from 1967, with the appearance of Michael Scriven’s article “The Countenance of Educational Evaluation” (Popham 1975). Popham’s dating seems consistent with a later annotated bibliography (Fraser 1989); thirty-nine book titles listed were published after 1967. Why the sudden expansion of the field in the late 1960s? Most commentators link it with the governmental need to evaluate the massive curriculum projects associated with the “curriculum reform movement” of the early 1960s sponsored by the Kennedy administration (Fraser 1989; see Pinar et al. 1995).

Despite the general, if not vague, definitions of the concepts of quantitative and qualitative, and their function as umbrella terms of convenience, they have become widely accepted in the scholarly literature. Quantitative research refers to the use of the techniques of randomized experiments, quasi-experiments, multivariate statistical analyses, sample surveys, and so on. In contrast, qualitative methods include ethnography, case studies, in-depth interviews, and participant observation. In the 1970s, methodological tolerance was an idea, not the reality. In the lead issue of a new journal, *Evaluation Quarterly*, P. Rossi and S. Wright (1977) asserted: “There is almost universal agreement among evaluation researchers that the randomized controlled experiment is the ideal model for evaluating. . . . If there is a Bible for evaluation, the Scriptures have been written by Campbell and Stanley” (p. 13). Quantification is legislated in research funded by the Bush administration’s *No Child Left Behind* program.

In addition to Eliot Eisner’s criticism (1971a) of the dominance of quantitative methods and the

“scientific” mindset, David Hamilton advanced five criticisms of quantitative evaluation. His first criticism intersected Eisner’s, namely that quantitative evaluation directs attention away from important aspects of educational programs that are not easily measured. Second, Hamilton noted that the interests of the evaluator and curriculum developer can conflict when the evaluator works to tighten experimental control by discouraging redevelopment in programmatic midstream. Third, quantitative evaluation tends to emphasize the interests of administrators and researchers rather than the practical questions of interest to teachers. Fourth, unplanned consequences are ignored in favor of intended outcomes. Finally, quantitative evaluation tends to overlook that consensus on curricular aims is unlikely (Hamilton 1976; Fraser 1989).

Eisner borrowed the concepts of “connoisseurship” and “criticism” from the arts to broaden and refocus the concept and practice of curriculum evaluation. The two concepts are intimately interrelated. Eisner explains: “Connoisseurship, generally defined, is the art of appreciation. It is essential to criticism because without the ability to perceive what is subtle and important, criticism is likely to be superficial or even empty” (1985, 219). The distinction between the two concepts is in function: to act as a connoisseur is to appreciate; to act as a critic is to disclose. Eisner explains further: “Connoisseurship is a private act. . . . It does not require either a public judgment or a public description” (1985, 219).

After the curriculum has been developed, that is, after the phases of policy, planning, design, implementation, embodiment in material form (including in print and/or technological forms), then supervised and evaluated, what is still missing in the effort to understand curriculum as institutional text? It is the experience of teaching and learning. In classrooms teachers and students encounter the materials that have been developed, and it is in this encounter that curriculum becomes mediated and symbolic social experience. In classrooms, as Philip Wexler (1992) might say, curriculum becomes a social practice. To sketch the relation between curriculum and teachers, we move to a brief discussion of pedagogy and then to a brief review of textbooks, one major medium through which the teacher-student encounter occurs.

CURRICULUM AS SOCIAL PRACTICE

Understood institutionally, curriculum and pedagogy do appear to be separate domains, and their relationship is often construed as linear (Doyle 1992). Institutionally, curriculum defines the knowledge to be taught; pedagogy is conceived of as the delivery system (Beauchamp 1961; Foshay and Foshay 1980). This view has a specific history (Kliebard 1986). As we saw in the section on implementation, teaching is commonly characterized as the means by which curriculum is implemented. Teaching came to function as a means of administrative control over the education of American youth.

In contrast to the study of curriculum, the study of teaching has remained close to academic psychology. This meant, in the 1930s, that research on teaching became infused by the behavioral psychology of Edward L. Thorndike and C. H. Judd (see Pinar et al. 1995). Research on teaching shared in the growing prestige of psychology as the core discipline of educational research. By the 1980s, findings from research on teaching became a source of authority independent from curriculum for prescribing and controlling quality in teaching practice (Doyle 1992). Put bluntly, much of research on teaching has been concerned with how to get teachers to do what others (usually administrators) want them to do (Pinar 2004). Teaching is viewed largely as a process of disciplining and controlling students so that they can learn what the experts have stipulated. In this institutional view of teaching, the curriculum becomes invisible (Doyle 1992).

This view is changing. No longer is teaching viewed exclusively as applied psychology. The “de-psychologizing” of teaching has invited multidisciplinary research, including work grounded in anthropology, sociology, and linguistics (Cazden 1986; Doyle 1978; Erickson 1986). Some have attempted to elaborate a view of pedagogy and learning grounded in critical theory, especially the work of Jurgen Habermas (Young 1988). Additionally, curriculum tends to be viewed as an important aspect of teaching (Shulman 1986). Miriam Ben-Peretz (1990) links the two: “To sum up: teachers are encouraged to see their major role in the partnership of curriculum development as that of informed and creative interpreters who are prepared to reflect on their curriculum and to reconstruct it” (p. xv). Others, how-

ever, disagree on this point: "teaching is unlike curriculum development" (Martin-Kniep and Uhrmacher 1992, 262).

W. Doyle (1992) reviews work in two important areas of teaching research: so-called content pedagogy and pedagogical content knowledge. Content knowledge refers to "attempts by cognitive scientists to understand knowledge representations and comprehension processes in various subject matter domains" (Doyle 1992, 497). These attempts are founded in attention to the learner's viewpoints or "paradigms" as they relate to comprehension of a particular unit of content (Marton 1989). "The ultimate aim," Doyle tells us, "is to generate content-specific theories of how people handle particular contents, rather than general psychological theory applicable across content domains" (1992, 497). This research tends to appreciate the situatedness of learning (Lave 1988; Kincheloe and Steinberg 1993; Kirshner and Whitson 1997).

The concept of pedagogical content knowledge is embedded in a larger view of teacher education and its knowledge base. Lee Shulman (1987) elaborates the following categories of teacher education's knowledge base: (1) content knowledge (i.e., the academic disciplines); (2) general pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organization that appear to transcend subject matter; (3) what Shulman terms curriculum knowledge, with particular knowledge of the materials and programs that serve as "tools of the trade" for teachers; and (4) pedagogical content knowledge, that special mix of content and pedagogy that is uniquely the province of teachers, their own particular form of professional understanding which includes knowledge of learners and their characteristics, knowledge of educational contexts (ranging from the workings of the group or classroom, the governance and financing of school districts, to the character of communities and cultures), and knowledge of educational ends, purposes and values, and their philosophical and historical grounds.

A major statement on the nature of teaching is Philip Jackson's (1986) study of the "practice of teaching." That teaching is more complex than commonly assumed is one of his main themes. He begins his study by questioning the public assumption that everyone knows how to teach, as long as the subject

matter is known. Knowing what to teach and knowing how to teach are quite different matters, he points out. With John Dewey, Jackson (1986) acknowledges that there are teachers who do wonderful work but do not conform to any specific methodology: "These naturally endowed teachers, we are asked to believe, are the ones who get by and even excel without formal training" (p. 9). That such individuals exist raises the question: are there any formal laws or rules of teaching? Being fair, impartial, and caring are all commonsensical attributes of a good teacher, he points out. However, common sense is insufficient.

In the face of such uncertainty, how can we judge what is "real teaching?" Jackson draws three conclusions. First, he insists there is no such thing as a behavioral definition of teaching and there never can be. The second is closely related to the first: our attempt to say when a person is or is not teaching is always an act of interpretation, a view not dissimilar from that of Eisner's. The third conviction, one that follows from the first two, denies the possibility of our ever arriving at an enduring or universal definition of what it means to teach.

Acknowledging that, Jackson identifies three basic approaches to teaching: "the generic, the epistemic, and the consensual" (p. 89). He examines and rejects each approach, although he seems to privilege the consensual. Jackson (1986) asserts: "To put the argument in a nutshell, there is no such thing as 'genuine' teaching. There is only an activity that people call teaching, which can be viewed from a variety of critical perspectives" (p. 95).

Larry Cuban (1983) has asked how teachers have taught, and the answer he provides is a historical one. Consulting descriptions of 1,200 classrooms and 6,000 teachers, Cuban (1984) was able to produce composite sketches of mainstream teaching during several periods during the past century. "At the turn of the century," he begins, "the prevailing form of teaching was teacher-centered. . . . Classes were taught in a whole group. Teacher talk dominated verbal expression during class time" (1983, 163). During the next period—1920s and 1930s—in urban schools in cities such as Denver, New York City, and Washington, D.C., and rural schools across the nation, Cuban found that the majority of elementary teachers continued to use pedagogical practices that emphasized large-group instruction, recitation, seatwork, and little student mobility. There were, he

reports, a substantial number of teachers (and not only in New York City where the Activity Program [1934–1941] was underway, and in Denver where successive school administrations nurtured progressive approaches) who experimented with the rearrangement of their classroom furniture, and with variegated grouping of children for instruction, with the use of projects that encouraged students to express themselves and move around freely in the classrooms. Cuban found some progressive practices were used and others were not, showing up without a predictable pattern in both rural and urban schools (for an antiprogressive view, see Ravitch 2000).

Although Cuban reports that progressive teachers were never a majority in any setting he studied, these teachers did represent substantial minorities in various districts. What did Cuban find in secondary schools? “If there appeared to be modest changes in elementary classrooms, that didn’t seem to be the case at the high school level. . . . What occurred in most high school classrooms were mere traces of progressive practice” (Cuban 1983, 164).

Cuban (1983) did find exceptions, as we would expect given the influence of the Eight-Year Study (1933–1941). For example, Denver’s five high schools that participated in the Eight-Year Study established experimental classes in each of its schools (see Pinar et al. 1995). Cuban reports that never more than one-quarter of the student body and faculty were involved in these progressive educational experiments; their classes were quarantined in a separate wing of the building. The last vestiges of curriculum changes that grew out of the Eight-Year Study in Denver had disappeared by 1954, a time when the “life adjustment movement” was under sustained attack by conservatives such as Arthur Bestor.

By the beginning of World War II, Cuban tells us, the common patterns of instruction included the following: (1) employing the entire class as the primary teaching vehicle, (2) use of the question-answer format, (3) a teacher monopoly of classroom talk, and (4) a general reliance upon the textbook that has been basically undisturbed, except for those progressive experiments mentioned earlier. Cuban then moves to the years after 1965 when another reform impulse resulted in new ideas, additional money, and new faces in public schools across the country. Informal education, open classrooms, and alternative schools were among the innovations tried to varying extents

in different locations. What were the results? These efforts at innovation “produced a composite portrait of school teaching not unlike that of previous generations: teachers talking most of the time to the entire class, listening to student answers, assigning portions of the text to the class for homework—the meat and potatoes of instruction” (1983, 164).

The last period Cuban surveys, the present one, begins in 1975. Since that date, he reports that the dominant pattern has continued to be teacher-centered instruction with some small percentage of elementary teachers developing hybrid versions of what twenty years ago were characterized as open classrooms. In high school classrooms, little variation from the dominant teaching pattern is discernible.

In a review of research on textbooks, Richard L. Venezky (1992) notes that a textbook functions both as a cultural artifact and as a surrogate curriculum. He employs the term *intertextuality* to refer to a textbook’s relationship to preceding textbooks, and the term *validation* to refer to processes of legitimation. Historically, Venezky identifies three major attempts to study the general character of textbooks and their use in schools. The first was published in the Thirtieth Yearbook of the National Society for the Study of Education, which focused exclusively on the preparation and selection of textbooks (Whipple 1931; Venezky 1992). In general, textbooks were praised in this early publication (Venezky 1992). A second effort proceeded under the leadership of Lee Cronbach at the University of Illinois as the Text Materials Study, summarized in *Text Materials in Modern Education* (Cronbach 1955). A third effort has been published as *Textbooks and Schooling in the United States* (Elliott and Woodward 1990).

Venezky (1992) cites three sources for control of textbook content: federal and state government, publishers, and society. Venezky suggests that the influence of federal and state governments has been relatively weak. He writes: “Almost by default, the primary influence over textbook content has been left to two groups: the publishers and society, as represented both by broad social movements and by special interest groups that act directly upon the schools and publishers” (Venezky 1992, 444). Textbooks are profitable, grossing well over \$2 billion a year (Squire and Morgan 1990). One question concerns the extent to which textbooks are a function of business as opposed to educational interests. Over

twenty-five years ago John Goodlad (1979, 34) observed that business exercised a strong influence: "In fact, it is fair to say that the ends and means of curricula frequently are determined by publishers and not by the elected representatives of the people, although the process is a cyclical one, with the identification of who is influencing being exceeding difficult." Relatively little is known about how the textbook industry operates, despite several conjectures (Apple 1986; Luke 1988; Venezky 1992).

Historically, special interest groups, usually on the political right, have influenced the ideological content of textbooks (see Zimmerman 2002). Their success illustrates the vulnerability of schools to political pressure (Venezky 1992). Constitutional issues, including Supreme Court decisions regarding textbooks and censorship issues in particular, have been carefully reported and analyzed by Tony Whitson (1991). One of the most famous cases occurred in Kanawha County, West Virginia, where conservative parents fought to keep "humanism," "socialism," and other threats to their fundamentalist beliefs out of school textbooks (Moffett 1988; Watras 1983). Their victory, and others like it, has had the effect of tightening a conservative noose around an already conservative textbook industry. Commenting on another issue (that of school reform), one professional association has noted: "A danger arises when a minority group works aggressively to impose its beliefs on a slumbering—or misled—majority" (Willis 1992, 4).

An 1895 biology textbook was the first to mention the theory of evolution, while many textbooks ignored the subject (Skoog 1979, 1984; Rosenthal and Bybee 1987; Venezky 1992). In 1920 the state of Oklahoma outlawed textbooks that mentioned evolution, and soon after the state of Tennessee forbade the teaching of evolution generally (Venezky 1992). Following that law was the famous Scopes trial held in Dayton, Tennessee, in 1925. A high school teacher, John Thomas Scopes, had agreed to test the Tennessee law banning the teaching of evolution. William Jennings Bryan, three-time Democratic candidate for president, argued for the Tennessee statute, while Clarence Darrow defended Scopes. The prosecution won the case, only to have the decision reversed at the state court level on a technicality. The statute forbidding the teaching of evolution remained on the books (Venezky 1992).

Not long after the Scopes trial, Mississippi and Arkansas passed similar legislation, forbidding the teaching of evolution. The Arkansas law, known as the Rotenberry Act, reached the Supreme Court in 1968, at which time it was judged unconstitutional to forbid the teaching of evolution in public schools and universities (De Camp 1969). Tennessee responded in 1973 with a law requiring that equal instructional time be given to the Genesis version of human creation. The California Board of Education had taken a similar position in 1969. The "equal-time" Tennessee law was declared unconstitutional and repealed in 1975. The California board reversed itself as well (Venezky 1992). Currently, those who object to the teaching of evolution are not primarily residents of Appalachia (as in the case of Kanawha County, West Virginia) but residents of areas such as southern California and urban Texas (Nelkin 1976). The growth of right-wing influence, starting with the election of Richard Nixon to the Presidency in 1968, has been largely uninterrupted, and textbook series—such as MACOS (an anthropology-based social studies curriculum; see Pinar et al. 1995)—which were not sufficiently sensitive to the special ideological interests of the right-wing, have suffered (Conlon and Dow 1975; see also Good, *in press*).

Students comprise the themes of research in several sectors of curriculum scholarship, especially in the phenomenological and autobiographical-biographical traditions (see Pinar et al. 1995). However, in a recent systematic review of "students' experience of the curriculum," Frederick Erickson and Jeffrey Shultz (1992) note: "Neither in conceptual work, nor in empirical research, nor in the conventional wisdom and discourse of practice does the subjective experience of students as they are engaged in learning figure in any central way" (p. 466). Perhaps not in a central way, but students have occupied important places in curriculum discourses from the beginning, from early twentieth-century child study. As Erickson and Shultz point out, that "place" has tended to be a passive one, as their portrait of the curriculum as "school lunch" indicates.

Erickson and Shultz (1992) employ the image of school lunch to convey what they see as the mainstream view of curriculum and pedagogy in relation to the student. In this image the teacher's job is to take packages of "mind-food" from the freezer (the written curriculum), thaw and prepare them (instruc-

tion), and monitor students' eating until the food is gone (classroom management for maximization of time on task) (Erickson and Shultz 1992). This view of the student's role in contemporary education is similar to that of Freire's (1968), in which the student is viewed as the repository of banking deposits (i.e., information). In both images the student is passive, and the teacher's role is sharply circumscribed.

A highly suggestive study of student experience is Philip Wexler's (1992) ethnographic research on school life and identity, entitled *Becoming Somebody*. With the assistance of Warren Crichlow, June Kern, and Rebecca Martusewicz, Wexler (1992) represents the "different lifeworlds and . . . dynamic organizational economies that generate and sustain diverse understandings and aspirations" (p. 8) in three upstate New York high schools. Wexler observes: "Each student contributes to his own self-production by the interactional labor that he performs" (p. 10). One school is urban, one is middle class, and one is working class.

Wexler concluded that in different ways, the self is under assault in each of the three high schools he studied, a subset of "macrostructural historical and socioeconomic processes" that become institutionally enacted with the organization of school life "as a dynamic for controlling and dampening self-expression for the sake of population control" (1992, 126). Wexler regards this process as a "social emptying of the self," against which the students fight (p. 126). One strategy is withdrawal from official school life and an intensification of peer experience. However, this strategy is doomed to fail. Wexler concludes: "The struggle for self activates powerful and expressive peer networks that decentralize the self, as the best, though ironically, self-defeating form of self-defense" (Wexler 1992, 127).

The extra-curriculum refers to those activities and events sponsored by the school that occur outside the formal school curriculum. Extracurricular opportunities include sports, music (such as marching band, orchestra, and chorus), student publications (such as newspapers and yearbooks), drama, debate, student government, student clubs (such as future farmers, future teachers, etc.), and assemblies. Sometimes these activities have been viewed negatively, or as unconnected to the academic curriculum. A more neutral set of terms, including the third curriculum, the informal curriculum, and most recently

co-curricular activities has been developed (Berk 1992). This final term has been espoused by those educators and other students and practitioners of curriculum who regard these activities as an essential aspect of school experience.

William F. Pinar

THE INTERNATIONALIZATION OF CURRICULUM STUDY

While many scholars (for instance, see Schubert 1991; Rogan and Luckowski 1990; Rogan 1991) have called for attention to international dimensions of curriculum study, not until the publication of *Understanding Curriculum* in 1995 did a major synoptic textbook devote a chapter on the subject (see Pinar et al. 1995). This omission is somewhat understandable, given that curriculum studies is very much embedded in national culture (Pinar 2003). Moreover, the effort to understand curriculum internationally is too large and too complex an undertaking to be surveyed comprehensively in one chapter. Despite this problem, some attention is necessary. There are two professional associations for curriculum specialists interested in international issues: the World Council for Curriculum and Instruction (Overly 1988, 2003) and the International Association for the Advancement of Curriculum Studies (www.iaacs.org).

Curriculum developments are not sealed airtight within national boundaries. Just as economic, political, and ecological phenomena increasingly ignore national boundaries, so do educational issues. For example, recently there has been an intensification of "whole language" versus phonics reading programs in the United States, the former committed to the integration of the language arts and reading throughout the curriculum with an emphasis on experience and inquiry, the latter concentrating on sound and drill. The "whole language" approach finds its roots in the language arts curricula of New Zealand where children learn to decode words in context as they read (Burns 1991).

A wide range of educational planners, consultants, professors, and students have an interest in the international dimensions of curriculum. Businesses with

international trade interests, global industrial entities, missionaries and religious organizations, political scientists, and foreign aid agencies all monitor international educational developments. Politicians and governmental officials utilize educational trends and issues to promote specific agendas within their own spheres of influence (Feinberg 1993). The publication of *A Nation at Risk: The Imperative for Educational Reform* (NCEE 1983) in the United States rationalized aggressive and conservative educational reform based on the allegation that student achievement in the United States was deficient when compared to students in other nations, particularly economic competitors Japan and Germany. Such international comparisons fueled a decade of political rhetoric and educational reform in the United States. (As we saw in entry one, such arguments have been used before: the Sputnik event in 1957 prompted national curriculum reform in the early 1960s.)

Scholarly interest in the study of curriculum internationally is not a recent phenomenon. Internationalism—then linked with political movements on the Left—was advocated by progressives like George S. Counts and Theodore Brameld (1904–1987). Counts's major statement—*Dare the Schools Build a New Social Order?*—was written after returning to the United States from a trip to the Soviet Union in 1930. As Counts witnessed the deepening social crisis that accompanied the Great Depression (a condition he regarded as inexcusable), he worked to awaken educators to their investment in social and cultural reconstruction. Counts's central thesis was that modern science, technology, and industrialization had created social inequalities which education must labor to correct (1929, 1951, 1962; see also Perlstein 2000).

Global education communicates those problems and issues that cut across national boundaries. Particularly, global educators are interested in the interconnectedness of systems—ecological, economic, political, technological, religious, cultural, and educational. One widely accepted definition of global education states: "Global education involves perspective taking: seeing things through the eyes and minds of others—and it means the realization that while individuals and groups may view life differently, they also have common needs and wants" (Hanvey, quoted in Tye 1991, 5). Like Counts and Brameld, Robert Hanvey and Kenneth Tye encourage an interdiscipli-

nary approach that emphasizes current events, worldwide concerns, cross-cultural exchanges, cooperative programs, and international order (Tye 1991).

With increasing numbers of immigrant children in many developed nations, expanded opportunities for education in South Africa, Eastern Europe, and the republics of the old Soviet Union, increased English as a Second Language (ESL) instruction in the United States, and the effects of mass media on an ever "shrinking" world community, the international classroom is a reality, whether intended or acknowledged as such. Global education aspires to provide models of this interconnectedness, interdependence, and interrelationship of world cultures in an educational effort to promote cooperation and progress (Tye 1991).

Global education has been criticized from the right (see, for instance, Kah 1991). But even politically conservative scholars, such as Diane Ravitch, assert that "we have much to gain by learning about other cultures and . . . they have much to gain by learning about ours. Learning about other people does not require us to relinquish our values" (Ravitch 1989, 20–21). Ravitch and others (see, for instance, Kenneth Tye 1991) argue that changes in educational programs, state guidelines, and textbooks should place more emphasis on world cultures, world history, and geography.

Until recently, most North American scholarship devoted to understanding curriculum internationally occurred in Canada. In "The International Classroom," Terrance Carson (1990) contends that Canadian classrooms have become international, not because of any plan but due to the circumstances of the present age. Canadian classrooms have become internationalized for several reasons: television has brought global events into Canadian homes and classrooms, new immigrants have arrived from Vietnam, El Salvador, Rumania, and Lebanon who speak neither of the official Canadian languages (English and French) and, as a result, ESL (English as a Second Language) programs have proliferated throughout Canada. Carson asks two significant questions regarding the emerging international classroom: how are we to respond to the cultural "other" who is already in our midst?, and how will we learn to live humanely in a world that is in a period of transformation? This double issue of the globe in the classroom and the classroom in the globe reveals that the local school becomes a focus of international cur-

riculum experience. Carson contends that teacher education programs must encourage educators to interpret and act in accordance with the daily realities of their own classrooms rather than perpetuate an over-reliance on the authoritative voice associated with the modern age. He concludes his study by juxtaposing a postmodern classroom that moves from difference to identity through the development of an ecumenical and ecological peace culture against the modern classroom that moves from difference to standardization through the development of an “ego-logical” war culture.

Writing “Of Literacy and the Curriculum in Canada,” John Willinsky (1992a) argues that literacy education in Canada ought “to afford the young a means of not only mastering the skills of reading and writing, but of exploring and participating in the world of text” (p. 278). Willinsky’s (1998) most recent scholarship exhibits postcolonial influences, and is focused on a curriculum for thinking about the implications of five centuries of Western imperialism. He identifies the position of the tourist as indicative of the colonial gaze of the Westerner; he is committed to redirecting it inward. Willinsky’s award-winning scholarship is a strong example of the internationalization of curriculum study.

Ted Aoki brings a phenomenological view to bear on issues of intercultural education, specifically as these surfaced in the internationally attended graduate program in curriculum studies at the University of Alberta. Revealing his characteristic pedagogical movement from the abstract to the concrete, from the theoretical to the anecdotal, here from the local to the global, Aoki conceives of graduate study as “a conversation of mankind” in a “trans-national situation” (in Pinar and Irwin, in press).

Speaking with students who have come to Alberta from beyond North America, Aoki is reminded of the instrumentality of his assignment as an administrator and of the centrality of conversation in the process of education. In this intercultural educational experience, Aoki worries about the erasure of originary identities. “To remind ourselves of who we are in conversation,” he suggests to these students, “I ask that we turn the conversation to ourselves.” He poses to them what might be the central curriculum question in an era of globalization: “How will you know that what we consider ‘good’ here is ‘good’ in your homeland?” (in Pinar and Irwin, in press).

An organizational and intellectual movement underway supporting “the internationalization of curriculum studies” may internationalize the study of curriculum in the United States. While this movement accompanies and is no doubt stimulated by larger forces of globalization (see Held et al. 1999), it tends to be suspicious of the cultural homogeneity and economic centralization globalization threatens. Inspired by the work of Aoki, Carson, and Willinsky, among others (see, especially, the work of David G. Smith [2003]), Americans have established a U.S. affiliate (<http://aaacs.info>) of the International Association for the Advancement of Curriculum Studies, published the first international handbook of curriculum research (Pinar 2003), and have recommended the inclusion of international studies in curriculum studies programs (see Pinar 2004, appendix). Through internationalization, historicization, and theorization, the study of curriculum will become more developed, and its scholarly production more sophisticated.

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INSTRUCTION

Arguably, instruction is the key process in education. At the heart of educational institutions, it is the process around which schools are formed and educational legislation passed. Ironically, instruction simultaneously represents both the most discussed and, given its many layers, the least understood domain in education.

Examples of a few ways instruction may be discussed and examined include issues of purposes, teaching, learning, students, teachers, policy, specific communities, social issues, and subject matter content. Further, each of these approaches to the topic is value laden and embodies a range of diverse and often conflicting perspectives. Yet a working and relatively explicit definition of instruction is essential to educators as this informs how they plan and enact learning processes. Just as important, a definition of instruction is important to noneducators, as it informs how they understand these processes.

One way to begin to understand the topic of instruction is through its relationship to the topic of curriculum. Two broad views of this relationship exist. One perspective holds that instruction and curriculum are closely related but separate realms, forming a curriculum-instruction dualism (Tanner and Tanner 1980, 30). In this dualism, instruction represents educators' implementation of subject matter content while curriculum represents the content itself and educators' initial planning for its implementation. Thus, this view emphasizes the *processes* that teachers use to deliver the curriculum and reflects a view of instruction as a method of content implementation. Implying a separation of instruction from content, this dualistic view then casts teachers as implementers and not creators of curriculum (Connelly and Clandinin 1988). One advantage to formulating curriculum and instruction into this dualism is that the separation allows for "research in instruction and the technology of instruction" (Tanner and Tanner 1980, 30).

However, an alternate view holds that instruction is an integral part of a broader curricular process. In this process, curriculum is a dynamic consisting of subject matter, student, teacher, and learning milieu (Lampert 2001; Schwab 1962; Clandinin and Connelly 1992). Teachers play a role in both the formulation of curriculum and its enactment, thus nullifying any duality between these two domains. This approach also reformulates the conception of teacher as something inseparable from the curriculum (Clandinin and Connelly 1992; Zumwalt 1988). In this view of curriculum and instruction, the distinction between material and methods, curriculum and instruction, is erased (Clandinin and Connelly 1992). The interactions of the various contexts within this dynamic create a lived curriculum that emerges at least as much as it is planned. Teachers do not "deliver" this curriculum—they, along with their students, experience it, becoming its participants (Clandinin and Connelly 2000). In this view of instruction, the social aspects of the curriculum are at least as important as those related to classroom books and materials.

In such an approach, teachers guide students as they discover or even create content. For example, in a middle-school science class, students may follow the scientific method to learn about ecology. Facilitated by the teacher, students may raise their own hypotheses about the causes of pollution in a body of water, conduct an experiment to test their hypotheses, develop findings, verify their findings, and reach a tentative conclusion. Such an example reflects what is commonly called a "progressive" view of instruction, where the teacher adapts what she is doing to better engage her students.

Independent of the curriculum-instruction dualism debate, one way to try to establish patterns among the diverse range of assumptions, values, and approaches to instruction is to draw teaching-and-

learning frameworks from broader curricular orientations. A curricular orientation is a “distinct and conceptually separate” approach to what takes place in the classroom (McLeod 1985, 10). Orientations are helpful in supplying a conceptual lens to facilitate categorizing multiple classroom events, and the curricular orientation often guides the approach to instruction.

Elliot Eisner, for example, discusses five basic orientations to the curriculum. The first orientation is the “development of cognitive processes,” where the teacher attempts to develop students’ cognitive or thinking processes such as the ability to “infer, to speculate, to locate and solve problems, to remember, to visualize, to extrapolate . . .” (Eisner 1985, 62). Emphasizing process approaches to teaching and learning, this orientation assumes that thought patterns may be generalized from one situation to another if a student develops the relative cognitive processes. For example, this orientation assumes that if a student learns how to problem solve in a science class, this student can then use this problem solving ability in a similar situation, whether inside or outside of class.

A second curricular orientation that Eisner mentions is “academic rationalism.” Eisner explains that “this orientation argues that the major function of the school is to foster the intellectual growth of the student in those subject matters most worthy of study” (1985, 66). Proponents of this orientation include as permanent studies such subjects as reading, grammar, rhetoric and logic, mathematics, and the greatest books of the Western world (Tanner and Tanner 1980, 6). Students engaged in an “academic rationalist” curriculum would study exemplary intellectual products in mathematics, languages, science, and history. The goal of this orientation is for students to develop reason based on these great works in order to examine life critically and intelligently.

A third orientation within Eisner’s framework is “personal relevance.” This curricular orientation “emphasizes the primacy of personal meaning and the school’s responsibility to develop programs that make such meaning possible . . . The curriculum is to emerge out of the sympathetic interaction of teachers and students . . .” (1985, 69). This orientation stresses the importance of allowing children to pursue individual learning interests.

Eisner’s fourth orientation is “social adaptation

and social reconstruction.” This orientation assumes that the purpose of education is to serve and promote the interests of society. As J. McLeod mentions, this goal often has contradictory outcomes as it plays out in reality based on how it is assumed that education can best serve society:

Firstly, social adaptation is concerned with the preservation of the status quo. The opinion, that schools should directly address themselves to the development of basic competencies, which will increase the employability of students, is a current manifestation of this curriculum viewpoint. Traditional values, subjects and methodological approaches are stressed . . . The second aspect . . . is social reconstruction . . . In this instance, schools are institutions [that] are actively engaged in what they see as the improvement of society. Students are encouraged to question and challenge the values and structures of society. (McLeod 1985, 13–14)

The fifth orientation is “curriculum as technology.” Stressing accountability—often in relation to student standardized testing—the purpose of this orientation is to promote students’ learning of specific predetermined behaviors and outcomes. Under this orientation, a teacher would define the learning goals and then plan clear, manageable steps for students to reach them. For example, students might learn mathematics by watching a teacher presentation, practicing and repeating computational steps given in that presentation, doing follow-up practice sets as homework, and then taking a final test on the content. The individual steps in this process are eventually combined to support students in mastering larger learning outcomes (e.g., from learning how to solve a basic equation to becoming proficient in algebra).

Eisner’s framework allows for the conceptual grouping of classroom interactions. For example, a teacher delivering a moving lecture to her Honors students about the great books of Western civilization is reflecting an academic rationalistic perspective. A teacher whose approach is more emergent and who “teaches” by way of student-defined projects is reflecting a “personal relevance” curriculum. While in reality teachers often use multiple approaches, often one particular orientation predominates.

The definition of instruction, then, is complicated and multifaceted, reflecting a range of beliefs. Either

knowingly or unknowingly, all educators (and many educational policymakers and noneducators) take at least one and often multiple and shifting, contradictory positions about the meaning of instruction. These beliefs and values include those related to views of teachers, teaching, and learning, who should decide what takes place in classrooms, and the best relationship between schools and society. These beliefs in turn reflect foundational understandings and questions in education. One such issue, for example, is the relationship between schools, language, culture, and learning.

This chapter intends both to define specific aspects of instruction as well as explore some of the broader issues and questions that inform instructional approaches. The discussion has been organized to explore some of the exciting possibilities that teachers, students, and others encounter daily as they plan and interact in classroom situations.

The first entry of this chapter examines the history and description of different forms of instruction, loosely arranged from more direct and teaching-centered forms of instruction to more emergent, authentic, and learner-centered approaches. We first examine direct instruction, focusing on lecture, presentation, and demonstration. Next, we discuss guided instruction, focusing on the type found on the elementary level. Here we explore historical and newer approaches to guided reading and guided discovery instruction, including that of Socratic dialogue and discussion learning. After examining direct and guided instruction, we explore authentic instruction. In this entry we trace the evolution of authentic instruction, from its roots in the writings of Rousseau to its various carnations in American Progressive Education. Specifically, we discuss discovery learning, inquiry learning, problem-based learning, and contextual teaching and learning. This entry concludes with a discussion about individualized learning programs such as SRA (Science Research Associates), mathematics programs, and computer-assisted instruction (CAI). After delineating some of the dominant approaches to instruction, the chapter then examines many of the debates and issues found within these approaches.

After discussing different forms of instruction, we examine some of the philosophical views that inform types of instruction. For example, we examine traditional didactic and constructivist views

of instruction. This discussion is framed by many of the seminal debates in education over the last five decades. These debates include those focused on the economy (instruction for economic competitiveness or for democracy) as well as standards and accountability. Following this discussion, we then examine instruction in relation to other influential contexts that educators consider when planning and teaching. These contexts include child development, subject matter influences, classroom grouping approaches, and societal issues. The intent of this entry is to delineate the impact of these contexts on instruction. While educators may consider some of these contexts in a clear and explicit way, they often consider others in a much less understood but no less significant manner.

The Instruction chapter concludes with a discussion of more local contextual factors that impact instruction, including classroom management and planning. Ultimately, in this chapter we hope to capture and clarify some of the unfolding dynamics at play in instruction.

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HISTORY AND DESCRIPTION OF DIFFERENT APPROACHES TO INSTRUCTION

Traditionally, instruction has been thought of as the practice of teaching people something, instructing them about what something is or on how to do something. Examples of this abound in everyday life and in historical texts. In its most basic terms, we consider learning to involve someone telling us about something or showing us how to do something and practicing it until we can do it successfully by ourselves. Knowledge—here considered knowing how to do things—is passed down from generation to generation, father to son, mother to daughter.

Historically, fathers may have taught their sons how to hunt, how to farm, what certain tools were and how to use them. They took them along with them on the hunt and into the fields and showed them how to be a hunter. Similarly, mothers taught

their daughters how to cook and tend to the needs of the family by having them work alongside them, learning by watching and doing, gradually increasing the complexity of the tasks involved. These are examples of teaching involving declarative knowledge (what something is) and procedural knowledge (how to do something).

This “tell me and show me” approach to knowledge acquisition has been used throughout the ages outside of the home as well. “Apprentices” learned prescribed skills for their trade from master craftsmen through watching the “expert,” followed by arduous repetition until the apprentice had mastered that skill. Many trades are still taught this way. Plumbers and electricians, for example, are apprenticed to an expert until they have demonstrated their acquired skills. This transmission form of learning about something and how to do something specific, such as performing a task or a skill, has been successful in many instances and remains one of the most popular ways of instructing. This transmission model, sometimes referred to as a transference model with knowledge transferred from one person to another, is what many people think of when asked about how things should be taught. They think of teaching as giving, and of learning as taking.

At the same time, however, learning involves more than just learning how to do something specific. Learning (at least school learning) typically includes acquiring knowledge of ideas beyond just specific skills. Students are expected not only to digest these ideas, but also to use them to build their ever-broadening awareness of the world around them. They are expected to be able to learn to think and create as well as just do. Students are asked in school to develop conceptual knowledge that allows them to integrate multiple ideas and synthesize them into new ideas. Some claim this is not possible through a direct transmission model.

To facilitate student thinking about ideas, the learner is often asked to question beliefs and the foundations of ideas. This involves higher order thinking skills not included in the transmission model. Students are expected to do more than just recall information or summarize data. They are expected to analyze their thinking and ultimately justify it. The Socratic Method exemplifies this approach: Socrates engaged his students in lengthy discussions or dialogues about a topic, and then continued to probe the students’ thinking with ever-

deeper questions, challenging their ideas. This model allows for the combining of ideas and the formation of new ones.

As students develop new ideas through this intimate process, their thinking may be transformed. Hence, this is often referred to as a transformational model of learning. It is a complex process that requires a skilled teacher—one who can justify his own thinking and help others with the process of analysis, synthesis, and their own evaluation of ideas. This skill is not easily taught or learned. As this often involves more abstract thinking than the concrete learning of skills, this form of instruction is less common than the transmission model and has historically been used mostly at the university level. The transformation model has typically been used on a limited basis in the elementary or even high school years where skill learning has often been a priority. This is an issue that will be discussed later in this chapter.

Through the years, the number of approaches to instruction, and the specific strategies within them, has greatly expanded as we have learned more about how people learn and different learning styles. In this chapter, we address some of the broader categories of approaches to instruction, from the traditional use of direct (transmission/transference) instruction to guided instruction and authentic (transformational) instruction and, finally, individualized instruction (which may include a combination of approaches).

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DIRECT INSTRUCTION

Direct instruction has historically been the most prevalent approach to instruction within many schools. Direct instruction—the transference of ideas and skills from teacher to student—is often exemplified by the lecture method. Johann Freidrich Herbart (1776–1841) codified the method into five discrete steps of instruction still used today: (1) preparation or motivation of students for the information about to be transferred; (2) presentation or summary of what this information to be transferred is; (3) association of this

new information to the knowledge assumed previously known by the students; (4) generalization of ideas, rules, principles to be learned through this instruction; and (5) application of these ideas to specific instances (Ornstein and Hunkins 1998).

In a lecture or recitation, the teacher addresses a group of students with a prepared script of information to be transferred. This is typically a passive form of learning by the students. The teacher transmits the information and the student receives it. Because of the lack of interaction between the teacher and students, lectures are regarded as one of the more economical forms of teaching and knowledge transfer. Lectures require only one teacher and can include an audience of students numbering several hundred. The onus is on the students to absorb what the teacher is transmitting.

Direct instruction can also be an effective means of transferring great quantities of information, which the students will process on their own at a later time. A properly structured lecture can highlight the important aspects of a topic and help the students make the necessary connections to frame the topic within their own schemas. It is important to note, however, that lectures are not typically contextualized or personalized, but are purposefully general in nature. They are not designed for one specific audience other than that they may be tailored to a certain level of understanding of the topic and may be framed within a series of lectures related to one another. A lecture is designed to fit the instructor's perspective of appropriate structure and organization of ideas, not that of each of the students. Within a lecture, there is little to no opportunity for questioning of the teacher or for pauses to process certain concepts. The pace and direction are controlled by the teacher.

The direct instruction approach also includes strategies that are less formal than the lecture model. For instance, direct instruction is often used when introducing new material and ideas to students. It may be utilized as a method for one particular portion of a given lesson or unit. This is what many refer to as the "teacher talk" part of a lesson. It is often declarative or procedural in nature. The teacher, standing before the class, introduces a new idea by telling the students about the idea and related information, connecting it to what they already know or have learned, helping them frame their ideas and giving them instructions about how they will

proceed with their learning. This teacher talk or presentation strategy differs from the traditional lecture model in that the teacher is connecting the information transferred directly to the experiences of the students. With traditional direct instruction, the teacher is not expecting the students to create anything new other than to be adapting their own schemas to this new information.

As an example of the presentation strategy, imagine a fifth grade social studies lesson introducing the concept of global exploration. A teacher may introduce the concept by talking to the students about different explorations they may have been involved in personally—exploring a museum or their backyards, for example. They might then connect these new ideas to what was most recently taught within this subject, possibly the study of "the old world." The teacher would then connect this idea of exploring to discovering new territories. The class might then review various places throughout the world that have been explored and by whom. With this type of instruction, the teacher determines which explorers and explorations are important by including them in the talk. This form of instruction can be personalized for the students in that it is tailored to what they have been learning and their personal frames of reference, but it is still essentially a teacher-centered strategy with little activity by the students. This is a presentation of information to be transferred from teacher to student.

A variation on this strategy is the teacher proceeding from the talking or telling part of a lesson to a demonstration of the way something works. This, very much like the master and apprentice model, is the teacher showing the students how to do something. In the context of school, it may be demonstrating an experiment or showing how to add mixed numbers. The students watch the demonstration and may participate in a question and answer session, but they are not personally manipulating anything. They are experiencing the "doing" vicariously. The learning is a transmission of procedures and knowledge as opposed to students learning through their own firsthand experience and involvement.

In both of these forms of direct instruction it is accepted that some form of student independent practice for reinforcement of the new information will be included. This practice could include traditional means such as completing worksheets or workbook

pages, but may also include more authentic forms of using the knowledge just acquired. The idea is to process the information that was transmitted so that it can be replicated and recalled as necessary.

Direct instruction plays an important role in many classrooms, helping to introduce new concepts and procedures and to broadcast information to a group of students. It is geared for a whole group, not specifically to individual learners. It does not take into consideration those who may already know the information, or those who will not be able to learn in this manner. It is expected that some will gain some reinforcement from the teaching and others will need extra assistance. Some refer to this as “teaching to the middle.” In addition, it is not designed to allow for the creative or critical thinking necessary for conceptual change. For that, there are other approaches that will be discussed later in this chapter.

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GUIDED INSTRUCTION

While direct instruction is a teacher-centered approach, guided instruction asks both the teacher and student to take an active role in the learning process. The teacher is still for the most part in control of the teaching, while the student participates as the teacher leads. With direct instruction students are asked to process much of the learning on their own. In guided instruction the teacher scaffolds the learning to the students’ levels, supporting and guiding them to higher levels.

One dominant form of guided instruction is discussion—similar to the Socratic dialogues. Rather than one student being the focus of the dialogic process, a class or small group works its way through ideas. The teacher may present an issue or concept for discussion and then systematically guide the students to new views or concepts. As the students are guided, they adapt this new information into their schemas of what they have previously understood.

Guided instruction can also be used with a small group or groups of students in exploring new concepts. Again, the teacher is still dominant, but the students may attempt various approaches to a task with the teacher helping them to analyze why they

are doing what they are doing and to recognize why that approach may or may not be working. One example would be in an inquiry science class where students are exploring the principles of bridge building. The teacher will set the stage with the materials, ask each student to think about what they already know about the concepts, experiences, and knowledge they may have of bridges, and then talk them through what is happening as they try different approaches. In this situation, the teacher guides the student by establishing the experience and helping to provide direction and make analytical connections—but it is the students who are making the choices within their own exploration.

Guided instruction has become very popular in reading instruction. Recognizing that students learning to develop the skills associated with reading do so at an independent rate, teachers can help by guiding this process, tailoring it to the students’ levels. They work with small groups of students on specific skills or concepts, helping to scaffold their learning, supporting them by supplying them with words they do not know, and selecting works that are within their skill range. The support of the teacher and fellow students helps the students move ahead in their skill attainment.

Like direct instruction, guided instruction involves some form of practice of the acquired knowledge. This practice is often group practice, where students work together through problems or ideas, discussing why certain strategies and responses are appropriate. This guided group practice could then, as with direct instruction, be followed with independent practice.

Guided instruction can take multiple forms within the classroom. It can be small group work, individualized work, or function as a whole class activity. The key is that the teacher guides the learners to higher levels by acknowledging what they already know, supporting their individual learning levels and styles, and designing instruction to meet these demands. In that the instruction is still dominated and controlled by the teacher, it is still considered to be teacher-centered, but with much student participation and activity. Given that it is still teacher-centered, the instruction may not reflect what is considered an authentic approach to teaching. Authentic approaches to teaching are explored in the next entry.

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AUTHENTIC INSTRUCTION

An overview of “authentic instruction” in education can be divided into three categories: school organization to support authentic instruction, classroom organization and teaching methods to actualize authentic instruction, and authentic assessment to ascertain what students learned from authentic instruction.

Before detailing each of these three categories, it is important to first define key terms—in this case, what exactly might be labeled “authentic” and “inauthentic” in terms of instructing students.

DEFINITIONS OF “AUTHENTIC” AND “INAUTHENTIC” INSTRUCTION

Proponents of “authentic instruction” seek to make schools a place where children learn more naturalistically, countering what some claim as the more pervasive school practice of students memorizing de-contextualized facts and engaging in practices that are meaningless outside of school.

With younger children, this approach might include teachers providing students with objects and other materials to manipulate, as well as facilitating the social situations in which students interact with these materials and each other. This approach would seek to encourage a young child’s natural curiosity and social development. At the secondary level, authentic instruction might involve students working on world- or work-related projects, applying knowledge and skills towards a usable end. Such an approach to instruction might spark or sustain a student’s interest or intelligence, combine multiple disciplines, or increase a student’s sense of self as a change agent outside of the school arena.

In defining authentic instruction, it is also important to note what “inauthentic” instruction might look like. Proponents of authentic instruction might make the claim that the way schools have been traditionally organized has been incompatible with real life. For example, schools have historically divided curriculum into discrete subject areas, whereas outside of school one must apply knowledge from multiple disciplines simultaneously. Teachers have also traditionally measured what students have learned through tests; yet one rarely takes a test once they leave school.

In summary, inauthentic instruction would organize learning around traditional school goals—ascertaining content area facts and skills measured through examination. In contrast, proponents of authentic instruction would organize schools and classrooms around real-world tasks and the interests of students.

However, it is also important to note that within the larger authentic instruction philosophy of teachers preparing students to exist more fully in the real world, there are wide-ranging perspectives as to what the goals of authentic instruction should be. Some approaches to authentic instruction focus more on developing a sense of community, caring, and ethics; others on service learning and community action; while still others are more explicitly geared toward learning for the workplace.

SCHOOL ORGANIZATION TO SUPPORT AUTHENTIC INSTRUCTION

There are a variety of ways that schools around the world have been organized to support authentic instruction at both the elementary and secondary levels.

One of the earliest iterations of authentic instruction in formalized schooling is the “Montessori Method” developed by Maria Montessori, who opened her first “Child House” school in Italy in 1907. Montessori schools are for preschool and elementary school children, and operate under the assumption that teachers should help students discover and develop their unique and individual talents.

The Montessori philosophy claims that what children need to develop is the ability to think and reason humanely rather than the capacity to memorize facts. To this end, Montessori schools are structured to more authentically match the world of a child’s developing imagination rather than false impositions from the adult world. Someone observing a Montessori classroom might witness children walking around freely, choosing objects to work with, and learning by doing in the physical world. Teachers employ an integrated approach to the curriculum, and call students together for “lessons” based on actual student need rather than a preset bell schedule. In approaching Montessori instruction, teachers focus on individual children, and seek to motivate students to love learning rather than achieve a grade. The overall school environment is set up for focused discovery.

American schools that have organized around simi-

lar philosophies have been greatly influenced by the writings of John Dewey and the “constructivist” movement in education (1902; 1938). The constructivist philosophy directly ties together experience and education, positing that learning is a mental construction where one builds on prior and current knowledge to develop new knowledge. Dewey believed that “thinking is doing,” and many child-centered schools throughout America are organized so that children can work with materials and inquire how things can be created in the world. This type of school organization embodies the authentic ways that children might learn and do outside of school. More recent theorists on learning, like Howard Gardner (1983), have illustrated how this constructivist approach to learning is consistent with brain research and the development of an individual’s multiple intelligences. Some schools, such as The Key School in Indianapolis, Indiana, have organized their entire curriculum around students discovering and developing their multiple intelligences through pursuing theme-based projects.

At the secondary level, in concert with efforts since the 1980s to break down large comprehensive schools into smaller, themed schools, there has been a movement to make learning more authentic. To this end, a variety of ways to reorganize secondary schools has emerged. For example, some schools (like Central Park East Secondary School [CPESS] of Sizer’s Coalition of Essential Schools in New York [CES]) have reorganized time to support authentic instruction. CPESS has students engage in areas of learning for “blocks” of time rather than discrete 40–50 minute periods. The idea is that block scheduling allows for in-depth inquiry and sustained efforts towards a goal, and thus, is more in line with how one would operate in the world. This allows teachers to focus on students’ intellectual and social development, as well as on embedding “habits of mind” in inquiry into subject matter. At CPESS, student learning culminates in a Senior Institute where students graduate high school via an elaborate portfolio process. CES schools emphasize depth over coverage, theorizing that such attentive inquiry is more authentic and lifelike.

A related structure that has emerged to assist secondary schools in making learning more authentic involves students in community-related experiences from brief “job shadows” to extended internships,

apprenticeships, and service learning. Under this model, used by schools such as The Met School in Providence, Rhode Island, in-school experiences are combined with out-of-school work and connections to the community. Within this type of school organization, students may be in school three days a week or less; and when they are in school, you are apt to find them working independently or in one-on-one consultation with an adult/teacher.

CLASSROOM ORGANIZATION TO SUPPORT AUTHENTIC INSTRUCTION

As previously stated, learning that is organized around authentic instruction may not take place in traditional classroom settings, or may do so for only part of the student’s educational experience. In instances where teachers and students interact in more traditional classroom settings, there are a variety of ways that teachers may approach instruction to make it more authentic.

One umbrella approach to authentic instruction is Project Based Learning (PBL). Teachers using a PBL approach to instruction might teach thematically (e.g., a science teacher might use the theme of “Connectedness” for a particular unit). During the unit, the teacher would mix direct instruction with student inquiry, gradually moving from the former to the latter. Using the example of the field of science and the theme of Connectedness, students over time would choose a question or area to investigate (e.g., How do city population shifts impact air quality?). Students would then do more in-depth independent research into their area of inquiry, using skills and scientific thinking emphasized and modeled by the teacher. The project may culminate in different levels of “authenticity”: (1) Students may present what they learned and concluded to their peers; (2) Students may present what they learned and concluded to government officials, environmentalists, or in some other public forum; and (3) Students may use what they learned to try to impact environmental policy and practice. Also, students might use multiple methods in presenting what they ultimately learned (or did), drawing from their multiple intelligences.

It also is possible to use a modified version of authentic instruction on a smaller scale, for example, for individual lessons rather than whole units. A math teacher might present the class with a real-world

problem that can only be solved through the use of algebra. Then, students may work individually or in groups to solve the problem, applying the math skills they have learned. However, what happens with the end product from that lesson impacts how authentic the instruction is. If the students then hand in their materials to the teacher, receive a grade, and move on to the next topic the next day, some would say that this is more problem-based learning than authentic instruction. If, however, students continue to use algebraic skills to explore real-world local or global issues and solutions, then the instruction can be considered more authentic.

Teachers using authentic instruction in the classroom might view their role as more of a coach, facilitator, or guide. The student is no longer learning the material to impress the teacher; the teacher is helping the student inquire and learn for particular purposes that have real-life applications. In actualizing this role, teachers might have individual conferences with students, develop individual learning plans in consultation with parents, serve as a sounding board for ideas, as an advisor, and as a general resource. The teacher also might become a liaison with the community, arranging internships and service-learning opportunities.

One issue that arises for teachers using authentic instruction is assessment. Once teachers move away from multiple-choice tests and summative essays to inquiry projects set in “the real world,” questions of quality emerge. How do you ensure that the students are learning? Issues of authentic assessment are discussed next.

AUTHENTIC ASSESSMENT

In contrast with traditional measures of assessments (multiple-choice tests or essay exams), authentic assessments in schools seek to model the way individuals might be assessed outside of school. Rather than taking a timed test, a student being assessed authentically might have several weeks to explore a topic, cull together what they learned, and present their work by a deadline. The presentation could be in written form, in a mixed-media portfolio, or through a multimedia exhibition, or some combination of all three.

Although these forms of exhibiting knowledge may be more authentic than a test, even within these

modes of instruction teachers need to assess students. Whether this is done by grades or through narratives, projects, and presentations, there is still a need for some standard of judgment so that students, teachers, and parents can know what constitutes good work, and so that other institutions can know what an individual student has achieved.

One common way to lay out authentic assessment criteria for authentic tasks is through the use of rubrics. Through a rating system or scoring tool, rubrics communicate expected quality of work in different performance skills related to a task. Ideally, what makes rubrics authentic is that they are performance-based, as it is performance on tasks (rather than ability to take tests—which is only one type of task) that students will more often be evaluated on in their lives outside of school. When a teacher uses a rubric to evaluate products of authentic instruction, expectations are clearly printed for all to see (e.g., “Exceeds Expectations,” “Meets Expectations,” “Approaches Expectations,” “Is Not Yet Ready”). Levels of proficiency from the rubric assessment may or may not be translated into a number/letter grade, depending on the requirements of the teacher’s school and state.

Though widely used, it is important to note that rubrics are not the only way to assess learning from authentic instruction. For example, some schools and teachers use narrative description of student work and progress, either in combination with rubrics, or as the primary system of feedback and assessment.

CHALLENGES TO AUTHENTIC INSTRUCTION

While different levels of authentic instruction are now widely practiced, there are also challenges to the viability of this type of approach to teaching and learning. One challenge comes from within teachers themselves, as teachers who have not experienced such teaching in their own schooling often have difficulties manifesting authentic instruction philosophies, especially without ongoing support. Moreover, schools (particularly secondary schools) have traditionally been organized around “control” of students, whereas authentic instruction involves allowing students to control, to varying degrees, the pacing, scope, and sequence of their learning.

On a wider political level, the recent rise of high-stakes testing has posed a great threat to authentic instruction. The resurgence of the testing movement came in response to the perception by some that progressive pedagogies were failing to serve students. Authentic instruction became a target for accusations of “feel-good fluffiness” in schools, with no concrete or measurable learning taking place. In the No Child Left Behind Act of 2001, test scores were the primary suggested measurement to determine whether a student, teacher, or school was failing.

As this chapter on instruction is being written, there is ambivalence and confusion about authentic instruction. There has been some backlash to the testing movement; yet many have embraced testing as a path to ascertain how students across social strata are performing in schools. Teachers continue to struggle to make learning relevant to their students, even as “the test” looms and dictates much of the curriculum. As schools react to threats of loss of funding, independence, or existence, for low performance on tests, authentic instruction continues in enclaves. About half of charter schools and many private schools are organized around authentic-based missions, sometimes receiving waivers on tests that other schools must adhere to so that their students and teachers can have more curricular choice and control.

As schools become increasingly market-driven, some argue that authentic instruction is still available where there is a demand through such avenues as charter and private schools. Others, however, claim that the widespread embracing of high-stakes testing by public schools has led to minimal levels of relevant thinking, reading, and writing for most students (King and O’Brien 2002). As public school students’ real-life interests are decreasingly valued in favor of a common set of standards, it is the more affluent students—through guidance and money from prosperous parents—who are able to transcend the basic school curriculum and experience “enriching real-life activities” in private (King and O’Brien 2002, 44–45). If this is true, it can be argued that authentic instruction is becoming a commodity obtained mostly outside of public schooling by those who know the most about it and are able to afford.

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INDIVIDUALIZED INSTRUCTION

Individualized instruction can be characterized as a learning relationship that is direct and customized. Teachers delivering individualized instruction would work to become aware of a student’s strengths, needs, and interests, and then would match curricular content and instructional method to the individual learner.

Instruction focused on the individual learner can occur in a variety of educational settings. Within traditional whole classrooms, a teacher might work with a student and her parents to develop an individual plan for inquiry and growth underneath an umbrella theme, topic, or sequence. Students with special learning needs might receive more official individualized learning via a process commonly called an Individualized Education Program (IEP), sometimes receiving instruction in smaller classes or with the aid of a paraprofessional. Another way instruction can be individualized is through tutoring, lessons, or apprenticeship, where the learner works one-on-one with a more knowledgeable person to develop particular skills or habits of mind.

Although individualized instruction commonly includes the learner receiving more personalized “face time” with a teacher, there are divergences in approach. For example, some individualized instruction focuses on developing the learner’s strengths, while others focus on ameliorating the learner’s weaknesses.

MULTIPLE INTELLIGENCE

Influenced by the work of Harvard University’s Howard Gardner in the 1980s, individualized instruction focused upon developing a student’s strengths has been bolstered by the concept of multiple intelligences (Gardner 1983). According to Gardner’s original theory, there are seven categories in which an individual can be intelligent (linguistic, spatial, musical, bodily-kinesthetic, logical-mathematical, interpersonal, and intrapersonal); Gardner later amended this theory to include an eighth intelligence (naturalistic). Because traditional mass instruction has focused primarily on the linguistic and logical-mathematical, some educators have embraced Gardner’s theories as a way to break from the past and tailor instruction to the many ways an individual can be intelligent. Thus, in-

dividualized instruction guided by the concept of multiple intelligences often involves a student learning unfamiliar content and skills through his or her strengths—which might include painting, composing, drama, and poetry. Within a particular domain of learning, the teacher serves as a bridge, drawing from the individual's innate intelligences to help the student learn new material.

As with programs attending to students' individual intelligences and styles, individualized programs have also been used for those who need enrichment. These gifted and talented learners often outpace the rate of learning of their peers and can also work on more advanced concepts. Many of these learners are able to work independently, which is one reason individual programs are appealing alternatives. The talented and gifted (or TAG) learners may work on independent research efforts, read texts at a higher level, take on external projects, or simply move ahead more quickly with class work. Programs like SRA's (Science Research Associates) reading program, initiated in the 1960s, were geared to allow accelerated students to progress independently at their own rate. Similar programs were designed in math, where students self-checked their work and met periodically with the teacher for more formal assessments and learning conferences. These programs, and others designed by classroom teachers, aimed to differentiate curriculum and instruction for TAG learners to ensure that the more academically advanced were challenged and motivated to continue learning at an accelerated pace.

SPECIAL EDUCATION

Students who have been diagnosed with a learning disability may receive individualized instruction through special education. When a student is certified to receive special education, an IEP is developed between school staff, parents, and sometimes the student, at an in-person meeting. Frequently included in the paperwork completed at these meetings are statements of goals and objectives for student learning, current performance in school, and any accommodations that might need to be made in order for the student to improve current performance and meet future objectives. Until recently, IEPs focused mainly on student weaknesses as a result of some disability; however, more recently, student strengths have been included in the individual learning plans.

RECENT TRENDS: TECHNOLOGY TO SUPPORT INDIVIDUALIZED INSTRUCTION

The recent rise of electronic educational technologies has created both opportunities and dilemmas for individualized instruction. Computers and the proliferation of educational software offer opportunities for students to work independently, with progress guided and monitored by computer programs. While some claim that such instructional software allows for learning to be more self-directed and self-paced, others say that this hyper-individualization removes human elements that are essential in the learning process: imagination, identification, and personal relationships between teachers and students (Smith 2003).

For a variety of reasons, there has been some discrepancy between the exceptional promise of the use of technology in the classroom to enhance instruction and the reality of its use. How technology has been used as a tool in support of learning has been limited and influenced by a number of historical factors.

In the 1960s and 1970s, technology in the classroom was divided into three related patterns. In one, instruction related to technology focused on computer literacy and learning to use computers. A second pattern focused on computer programming, and in a third, students used computers for rote learning focused on drill and practice sets. This third approach, influenced by behavioral learning theory and called computer-assisted instruction, encouraged students to work on specific practice sets or individual tutorials in areas such as vocabulary or math. For example, one computer application designed to help students learn arithmetic at this time “offered learner feedback, lesson branching, and a system for tracking individual student progress” (Means 2000, 197).

From the 1980s through the late 1990s, technology assumed an increasingly prominent role in instruction, with its uses changing in the classroom. Becoming more consistent with Vygotskian social learning theory, educators began to view technology as a learning tool that students could use in collaborative and interactive situations. Computer-enhanced instruction is a term employed to describe these more collaborative uses of technology. As Means states,

An important difference between these uses of technology and the computer-assisted instruction model dominant in the '80s is the nature of the instructional activity: The activity is much more than the technology and is initiated and orchestrated by a teacher, rather than by a software system. (Means 2000, 193)

Many forms of computer-enhanced instruction combine uses of online databases with production software and historical content. For example, students may access primary-source documents, such as journals written by members of the Oregon Trail, on a number of websites (for example, that of the Smithsonian Institute). Once they have accessed these Internet documents, teachers might have students collaboratively study and become meaningfully engaged in historical events or those in other content areas.

By 2000, a number of exciting Internet-based science projects had already appeared. For example, through the Global Learning and Observations to Benefit the Environment (GLOBE) program, students can become involved in real scientific investigations. From the comfort of their own classroom, students can work with real scientists and take readings of local atmospheric conditions as well as measure soil and vegetation conditions.

At the turn of the millennium, however, due to economic disparity, not all of these innovations have readily found their way into classrooms. The contrast between technology-rich and technology-poor classrooms where students do or do not have access to technology has been described as the “digital divide.” As Barbara Means states, “Only 39 percent of classrooms in the poorest schools had an Internet connection in 1998, compared to 62 percent of classrooms in the wealthiest schools” (National Center for Education Statistics 1999, as cited in Means 2000, 195). The implications of the digital divide for instruction are profound, given the central role that technology now plays in most aspects of American society.

INSTRUCTIONAL CHALLENGES

While individualized instruction has provided an alternative to traditional mass instruction, organizational conditions in schools sometimes make it a difficult practice for teachers to actualize. One challenge is the number of students a teacher must ac-

count for—the more students a teacher has under her charge, the more difficult it is to tailor instruction to individual needs and strengths. A related challenge is time (individualized instruction requires flexible schedules in tune with the pace of individual learners); however, schools are increasingly mandated to cover more topics in less time and have all learners reach the same “standard.” Finally, whereas textbooks and district curricula offer the same material and pacing to all students in an efficient and economic way, individualized instruction requires more on-site resources (i.e., libraries, books, CD-ROMs, Internet access) for the many paths of learning an individual student might follow. Thus, lack of resources often makes individualized instruction an out-of-the-ordinary practice; the majority of schools offering personalized instruction advertise it as something special beyond the educational mainstream.

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PHILOSOPHICAL ISSUES IN INSTRUCTION

Instruction, like most other areas of education, is wrought with issues of appropriateness. What is the best approach to instruction? Is there a best grouping, a best time to introduce concepts, a certain style of learning or particular culture that needs to be accommodated? This part of the chapter addresses these issues. First, various educational philosophical issues are discussed, focusing on the pendulum swings from traditional viewpoints to more progressive and contemporary positions. This discussion then continues by looking at subject matter differences and different ideological perspectives related to the disciplines. This is followed by a discussion of issues related to student development, looking at different educational psychologists' theories related to learning and instruction. In addition, this chapter looks at groupings used for instruction—whole class, small group, heterogeneous or homogeneous mixes, and individualized learning. Finally, the chapter addresses the various contexts of learning: who are the learners, what are their needs, and how do various forms of instruction serve them?

PROGRESSIVES VERSUS TRADITIONALISTS

In the United States, every ten years or so since World War II, the educational pendulum has swung. During one period, the Progressive philosophy—emphasizing individual student’s understandings and more holistic, naturalistic, authentic, experiential learning—will prevail. Then in the next, a backlash of traditional basic-core skill learning will take over, emphasizing reading, writing, and math skills (the Back-to-Basics Movement).

Following World War II, schools in the United States were mostly implementing a traditional approach, attempting to accommodate the baby boomers filling the schools and striving to beat the Russians in the space race through emphasizing math and science education. This change in what was taught was accompanied by a change in how things were taught. Instructionally, this ushered in the “teacher-proof” era in which curricula were designed to ensure that teachers would follow a script, a prescribed manual, or even bypassing teachers by hooking children up to new technology such as individualized audio tape programs.

Despite the efforts of proponents of teacher-proof instruction, it became clear that the teacher is key to the teaching and learning effort and cannot be removed from the situation through technical developments such as individualized or programmed instruction (Bond and Dykstra 1967). Fueled by the social upheaval of the sixties and seventies, there was a resurgence of the progressive movement with increased concern for individual learners and learning styles. There were efforts to look at the context of student learning, have more hands-on activities, more heterogeneous groupings, and more experiential and differentiated learning.

While progressive instruction is student-centered, its success requires highly talented and skilled teaching. Because this was not always available, progressive instruction was not always implemented in an effective manner, and the pendulum swung back to a more traditional or back-to-basics approach. This included whole-group teaching, homogeneous grouping, recitation, rote learning in math, phonics in reading, and much textbook work, mostly disconnected from students’ worlds. In this reversal, finding personal meaning in student learning was de-emphasized.

Through the eighties and early nineties, there was again a push for approaches that would recognize the needs of the learner, promote better understanding, depth of knowledge and critical thinking skills. Inquiry learning, authentic instruction, and approaches such as whole language reading and writing became more widespread. However, this is not an economical approach to learning, as it requires committed, well-trained teachers with support from families, schools, and communities. It is also a very local approach, focusing on each child, each class, and each school, without means for mass-producing or generalizing results. Due to the unwieldy complexity of this approach, we are currently experiencing a swing once again toward traditional values in education, emphasizing standardized testing and standards that may allow comparisons across large groups of students.

To this end of standardization, the intent in the current No Child Left Behind legislation is to raise the level of learning in core skill areas for all children in the United States. It is assumed that monitoring these efforts through testing will ensure this. For schools, teachers, and students, there are steep penalties for not attaining the desired learning levels. Specifically for instruction, this has translated into school districts and, hence, many teachers, adapting their instruction to these tests and standards rather than their students’ learning, learning styles, progress, interests, and needs.

Student-centered formative assessment, according to Grant Wiggins (1999), leads to improved student understanding. However, by adapting instruction to a standardized test rather than to their students, teachers are removing the contextual nature of the learning. In essence, they are removing the learner. By focusing attention on something standardized across the state or country, teachers alter the pacing of their teaching, attempting to “cover” all of the material to be tested rather than adjusting the amount of content to that which can effectively be learned by the student. In attempts to teach everything included in the tests, teachers economize, wholesaling some instruction to ensure it is at least seen by students. Echoing previous pendulum swings, teachers once again teach to the middle via direct instruction and tailor when possible with guided instruction. The level of interaction is limited by the quantity of what is to be taught. Students are once again passive recipients of knowledge.

In addition, the emphasis on standardized tests has altered the focus of instruction to only certain subjects and skills. As mostly reading and math have been tested, these are the subjects that now dominate the curriculum and teachers' instruction. Other subjects are perceived to be of less importance and therefore are not taught in depth or with much frequency. Teachers emphasize what they are directed to teach and what they are rewarded for teaching. The emphasis on assessments in math and reading leads to a lessening of teaching in subjects such as science and social studies.

For example, currently subjects such as science and social studies are more appendages to reading and math—science through informational texts or mathematical graphs and tables; social studies through stories. Under this traditionalist approach, learning how to teach science using an authentic inquiry-based approach becomes less important and therefore fewer learn how to do so. The current traditionalists, as has been historically true, want students to be able to read, write, and cipher, and with this foundation students are expected to acquire all other knowledge. Advocates of the arts, science, and social studies ponder the next swing of the pendulum or wonder if a balance may yet be struck.

THE READING WARS

Nowhere is the debate on instruction more vitriolic than the so-called Reading Wars of the last thirty years. Teaching reading has never been a simple straightforward practice. As reported by the National Reading Council in 1998, it is “such a complex and multifaceted activity, no single method is the answer.” (Showers et al. 1998) Until recently, it was not expected that everyone would or could learn to read at an advanced level, especially within a fixed time frame. According to Showers, Joyce, Scanlon, and Schnaubelt (1998), over much of the last century only about two-thirds of students learned to read effectively at a secondary level and even fewer in urban areas. It did not depend on which approach had been used: phonics, look and say, basal readers, or whole language.

The debate between a more natural, whole language approach espoused by progressive constructivists and a phonics-based approach promoted by traditionalists began to rage when Jeanne S. Chall (1967) pub-

lished *Learning to Read: The Great Debate*, supporting a phonics-based approach, incorporated within basal readers. This phonics purist philosophy resists any approach other than direct phonics and phonemic awareness instruction. On the other side, whole language purists criticize any use of isolated phonics practices. Along the sidelines, teachers of reading have typically supported a multidimensional, balanced approach; unfortunately, they are not always in command of what instructional approaches they may use.

In California in the 1980s, whole language was the designated curriculum choice for reading, but little support was given to teaching teachers how to use this new approach. While mandated by the state, its implementation was often poor if used at all. In the early nineties, after ten years of whole language, test results indicated very poor reading results across the state. Rather than targeting its poor implementation, the entire whole language approach was lambasted. Its focus on comprehension became the target for the poor results rather than other factors, including poor implementation, insufficient teacher support, and other societal factors. Since that time, proponents of phonics and phonemic awareness have used these and other comprehensive test results to attack the natural and holistic approaches. A phonics-based approach is now mandated in California and in many other states.

A balance in reading instruction is being encouraged by reading scholars—blending the decoding through phonics and phonemic awareness with holistic approaches of using multiple language experiences, assisting students to learn to decode as well as build strategies for comprehension, and building an interest in reading. In some areas, teachers are now being trained in balanced literacy approaches, learning to tailor reading to the individual's needs and focusing on inquiry (Fountas and Pinnell 1996).

MATH WARS

Similar to the Reading Wars, traditionalists in math encourage building a math foundation by primarily memorizing math facts, focusing on computational skill in a rote manner. In contrast, on the progressive, constructivist side, math instruction focuses on inquiry and understanding. Like the Reading Wars, the debate in the United States has been going on for many years.

Following the launching of Sputnik by the Soviet Union in the late 1950s, the United States prioritized math and science learning. In the early sixties, mathematicians and scientists were employed to correct the apparent problems in our school curricula that led to our inability to surpass the Russians in the early years of the space race. These highly regarded mathematicians and scientists created a “new math” approach, which focused on set theory and introduced more advanced mathematical concepts in a simpler state at an early level, hoping to stimulate later interest and talent in advanced math.

Unfortunately, most elementary math teachers were not given the necessary support in learning—let alone mastering—this new approach. The teacher-proofed curricula left teachers and parents at a loss about how to help their children learn math. A predictable backlash occurred with traditionalists calling for basic, old-fashioned arithmetic learning, that is, the memorization of math facts and simple computations with tried-and-true formulas. While mathematics textbook publishers were returning to this approach, math education researchers were exploring an approach to help students develop a core understanding of math concepts that was based on real life applications versus the isolated math facts or abstract concepts of the so-called new math of the sixties. This “new-new” math—*inquiry math*—became part of the National Teachers of Mathematics Council’s recommendation for math standards, based on both mathematical content and processes.

While the content included in the standards can be found in traditional textbooks, the approach to teaching is different due to the emphasis on process. The process approach to math instruction includes an emphasis on problem solving, especially of real world, student-based relevant problems. The students are asked to demonstrate their reasoning and proof of its effectiveness, communicate with one another about their strategies, represent their findings in various forms such as drawings, tables, and graphs as well as traditional computational expressions, and make connections to other areas of math, other subject areas, and aspects of their everyday life. For teachers, it takes more effort and more time to instruct in this manner than in the traditional rote-memorization approach. It also takes more time and

effort for the teacher to learn how to teach in this way, as the teacher must understand the concepts behind the math.

Such time pressures have been a problem with many of the progressive approaches and often bolster movements supporting traditional approaches. Proponents of a traditional approach point out that those students taking the time to “learn for understanding” may not do as well on standardized tests that ask them to compute math facts quickly at an early age. Lack of results on these tests creates doubt as to these students’ math achievement. The inquiry proponents assert that computational fluency is necessary, but not at the expense of understanding. The two, they believe, should go hand in hand. This may not happen with inadequately prepared teachers. While the battles continue, a balanced approach is once again being suggested in which teachers are taught the necessary basic math concepts, taught how to teach for understanding, and include in their teaching the skills necessary for computational fluency.

OTHER BATTLES

At the heart of the ongoing progressive-versus-traditionalist instructional dilemmas is the tension between teaching for comprehension of content and process and teaching for acquisition of content and basic skills. While this has been most apparent in the Reading and Math Wars, other subjects have also been entangled as they try to determine what standards are most critical for K–12 students. National experts in content areas such as math, language arts, and science have for the most part sided with those who favor a deeper understanding and an authentic, inquiry approach to learning. These standards involve students in an inquiry process in which they explore their understandings, investigate ideas in real world situations, and develop firsthand conceptual meaning of these subjects. This is a depth-versus-breadth approach to learning.

Many states, on the other hand, have focused their standards on minute, detailed aspects of content knowledge—the facts that would most likely be tested on national and international standardized tests. Teaching a myriad of miniscule facts is time consuming in its own right because so much needs to be covered. This typifies the breadth-versus-depth view. As these facts are often taught in an

isolated manner, as opposed to connecting the facts and integrating them as concepts or principles, much is not retained beyond the short term. If tested the next year, it must be taught again. With the fact-based approach, teachers do not utilize instructional tools to help these students make these connections. The proponents of inquiry assert that this disconnectedness hinders real learning and the development of an interest in subject matter that might create our more advanced subject area learners. Still, as long as these are the types of tests given, the states and districts are rewarded for a fact-based approach to learning.

This continued educational and instructional polarization has created a dichotomy for teachers trying to accommodate their districts as well as teach in a way that will ensure their students' long-term understanding. These are ongoing dilemmas, rooted in educational philosophies, for teachers trying to discern the best way to instruct their students.

One other philosophical difference between the progressives and the traditionalists is their perspectives on separation of subject matter content. Traditionalists believe that academic subjects should be taught in a pure form, keeping true to their individual natures and hierarchy of concepts. Progressives believe that learning is a holistic process that should reflect the manner in which the subjects appear in real life—blended with no specific boundaries. More traditional teachers might separate the instruction of subjects into individual lessons and segments of learning with the primary intent being, for example, to learn math in math class, and reading in reading class.

A more progressive teacher might blend reading into the subjects and the subjects into reading. To learn science concepts, for example, a teacher may encourage reading about science in trade books or picture books as well as informational texts. A science lesson may include math concepts such as having children learn to cook simple recipes, scientifically combining foods while measuring the amounts and proportions included in the recipe.

Progressive elementary teachers' instruction frequently emphasizes integrated thematic units. In an integrated thematic unit, students learn various subjects at the same time as they engage in a core-learning theme that integrates the subjects. Many times these themes are based on topics that will be appeal-

ing to student's interests, while also often including traditional material. For example, third grade students might learn about early colonial-period history in the United States by writing a play and creating period costumes; learn about the weather and climate of coastal Massachusetts by reading about the difficulties the Pilgrims faced; learn mathematical concepts through examining related holiday recipes to be made for the recreated feast; as well as learn about the foods and natural resources in these climates that were not available in Europe. To varying degrees, children may select what they want to learn and the teacher tailors the group's learning as the students' motivation and interest wanes or changes directions.

The issues that progressives and traditionalists differ on most significantly stem from philosophical arguments based on the nature of learning, and on the importance of the developmental and social needs of students. Drawing from experience and developmental psychology, elementary teachers who are progressively oriented tailor their instruction to the developmental strengths and needs of their children. The focus of the instruction changes according to the specific grade level. Pre-kindergarten teachers emphasize creative play, in many ways aligned to the theories of Jean Piaget and Lev Vygotsky. In creative play there is an emphasis on students' rule making, symbolic thought, creation of patterns, and both individual and group play. It is thought that such early symbol making is the precursor to more complex symbolic thinking, such as the child's acquisition of reading or mathematics skills.

Those who believe in more traditional methods might prefer a more strictly academic focus at these levels. A traditionalist instructor might de-emphasize the belief that students need to have instruction follow their particular developmental level and that teaching strategies should vary accordingly. A traditionalist would be more likely to believe that content and instruction should be the same, regardless of the student's developmental and social needs. This debate is played out throughout the early years of schooling into adulthood in each of the subject areas.

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DEVELOPMENTAL ISSUES IN INSTRUCTION

Developmental issues are concerned with growth and change that occur over time. Thus, developmental approaches to instruction have one main common theme—that learning is an individual and unfolding process. However, within developmental approaches, there are differing views about how that process evolves.

For example, some developmental approaches to instruction are based on strict “stage” theories and the belief that individual learners must pass through one stage before they can move on to the next. Developmental approaches that are less hierarchical might view learning as more of a series of “phases,” while dynamic developmental instruction might view the learning process as more cyclical. Instructional decisions will be impacted by a teacher’s position on this continuum, from choices in content and curriculum to pedagogy and approach.

Another way developmental approaches differ is in their attention to the individual isolated from the rest of the world versus the individual in the world. Stage theorists tend to focus on the individual as an isolated learner, while constructivist theorists tend to focus on the learner as part of a social world. Additionally, social constructivists consider the persons who share space with the individual learner, as well as the constraints and benefits of learning in a particular place. Social constructivists with a more critical bent might also consider how societal expectations related to an individual’s age, sex, race, and social status might impact a learner’s development.

An additional divergence within a developmental approach to instruction can be characterized as “the whole-part debate”: whether the learner must master the parts before they can comprehend the whole or whether developing understandings of parts and wholes can occur simultaneously. This divergence has great implications for approaches to instruction of such skills as reading; for example, whether emergent readers should be taught to gain proficiency with letters and words *before* whole text readings or *while* they are immersed in reading and writing whole texts.

Thus, while developmental instruction focuses on developing individual understandings over time, there are varying instructional emphases on sequencing,

the individual, societal influences, and developing isolated skills. Undergirding these disparate approaches to developmental instruction are a variety of theories on how people learn, which are discussed in the next section.

DEVELOPMENTAL THEORIES OF LEARNING

Stage theorists believe that changes in people across the lifespan can be explained by transformation in cognitive structures. They typically understand development as occurring in discrete areas (e.g., cognitive, moral, psychosocial) with individuals passing through distinct and qualitatively different stages.

Swiss psychologist Jean Piaget provided an early theory to explain human cognitive development, using four concepts to describe how the child passes through distinct developmental stages. Piaget refers to the mental network for organizing concepts and information as “schema.” “Assimilation” is a concept he used to describe the process through which one makes sense of experiences and perceptions by fitting them into previously established cognitive structures (schema). The process of creating new schema is called “accommodation.” Gaining a balance between assimilation and accommodation is a self-regulatory process that Piaget terms “equilibration” (Piaget 1969).

Several theorists consider moral and psychosocial stages of development. For example, Lawrence Kohlberg describes moral reasoning from childhood through adulthood. His proposed levels of moral development include: (1) preconventional, where moral reasoning is characterized by a focus on the consequences experienced by the person as a result of actions; (2) conventional, where individuals have internalized the rules or conventions of society; and (3) postconventional, where individuals move beyond the concrete rules and focus more on the principles that underlie these rules.

Constructivist theorists explain development in terms of people continually and actively creating systems of meaning through experiences and interactions with others. Such theories consider learning to be socially mediated. Constructivist theorists also tend to pay great attention to the social and cultural contexts of learning, assuming that interactions are a necessary condition for cognitive growth.

Russian psychologist Lev Vygotsky explained growth by stages, using the construct of the Zone of Proximal Development (ZPD). The ZPD is the difference between the level of competence a person can achieve alone and the level of competence to be achieved when working with a more expert other. A child, therefore, has the maximum potential for growth and development when they are functioning within their zone of proximal development. A further aspect of Vygotsky's theory of development is that learning occurs in social contexts. Learning is the outcome of joint cognitive activity with more expert others which the learner subsequently internalizes into independent cognitive functioning. (Vygotsky 1978)

The concept of "scaffolding" refers to the support given to learners by adults and more skillful peers through cooperative activity. This support enables the learner to participate in a task or solve a problem at a more advanced level of competency than they would be capable of in the absence of this support (Wood, Bruner, and Ross 1976). This theory indicates that what a person can do cooperatively today they may be able to do independently tomorrow.

Within the concept of scaffolding, the adult or more skillful peer controls those elements of the task that are beyond the learner's competence, allowing the learner to concentrate on those elements of the task which are within their range of ability (Wood, Bruner, and Ross 1976). Thus, social interaction is a critical feature of scaffolding as the expert and learner share "intersubjectivity"—a commonly understood purpose.

Scaffolding is temporary and adjustable (Cazden 2001), allowing the learner to participate in the mature task from the beginning. The level of support must be geared to the learner's changing level of competence and is negotiated by both the expert and the learner. The scaffolding concept assumes that learning will result through the interaction of the more skillful person with the learner, given the existence of specific conditions of the interaction. Wood et al. (1976) describe these conditions as: (1) recruiting the learner and focusing their attention on the task; (2) simplifying the task to suit the learner's level of expertise; (3) keeping the learner on task while constructing increasingly more complex versions of the task; (4) accentuating critical features through feedback; (5) giving the learner control over error situations; and (6) modeling ideal solutions to the task.

PHASES GUIDING DEVELOPMENTAL INSTRUCTION

Understanding how people grow and change throughout the lifespan is important in designing instruction. Although a learner's age is but one hierarchy by which to structure developmental theory and practice, it remains a prominent way to organize educational systems and philosophies of instruction. Thus, in discussing how developmental phases might guide instruction, the following segment follows the more traditional (yet current) format of grouping students by age and associated school level. However, it is important to remember that these are general categories, which only guide instruction, and that there are many exceptions that teachers frequently need to account for.

Infancy and Toddlerhood

As the infant becomes older, less time is spent sleeping and more time is spent responding to sensory stimuli in other activities. Also, physical rates of growth are at their greatest during these first three years of life, as the young child gains locomotion through crawling and then walking. At the same time, this increased physical activity and interaction with stimuli comes with safety concerns; thus, teachers of toddlers need to use carefully designed, safe-to-handle, and easy-to-manipulate objects.

Another key characteristic of these early years is that the child learns to understand and use oral language. Imitation appears to be a strong factor in paving the way for the first word utterance as young children interact in their social world. Vocabulary acquisition is typically very rapid once children begin to utter words. During these early years of using language, it is important that they have many opportunities to hear language and make approximations that are reinforced. Because play is often a young child's work, it is through playful exploration within their social and physical worlds that young children begin to develop mental concepts.

Early Childhood

During early childhood, children bring a special set of needs and strengths to instructional settings. One common characteristic is the inclination to ask questions of

the world, which can make the learning context both a place of inquiry and chaos. Aware of this developmental tendency, teachers working with preschool children might work to balance encouraging the questioning spirit with channeling inquisitiveness toward productive ends. Also, because younger children tend to not be able to follow complex directions, a teacher might work to keep the complexity and number of directions during instruction clear and manageable.

Play is also a critical component of development for young children. Three-year-olds often tend to be content playing on their own; however, as children develop, they often become interested in actively interacting with their peers and inventing imaginative play involving other children and adults. To this end, drawing is often the initial step toward young children beginning to grasp a concept of print as a way of communicating. The scribbling of the toddler begins to grow into distinct pictures and representations during these years. At around four to five years, the young child often becomes interested in the idea that scribbles or beginning letter formations can communicate a message to others.

Childhood

During the elementary school years, students progressively become less focused on playful experimentation and more focused on academic and social success. Forming and maintaining friendships gains importance and teachers aware of these developmental concerns often work continuously to make the classroom a place where all children feel welcome and safe. The careful monitoring of collaborative groups becomes particularly important, and a teacher might be observed instructing elementary-aged children on social ethics and interpersonal dynamics. Additionally, positive feedback from teachers often begins to matter a great deal to children of this age. Teachers may offer frequent praise reinforcing desired behaviors, coaching children through difficult academic or social tasks. There may be rewards for individual or whole class success, displayed publicly, or shared in private one-on-one conferences.

Early Adolescence

Typical of early adolescence is the tension between seeking the approval of others (peer group, adults)

and wanting to define one's individuality in opposition to others. This impacts the adult/teacher-adolescent/student relationship, as well as relationships within the classroom. One challenge for teachers is how to tap into the advantages of peer group approval to enhance instruction, remaining wary of the complex social dynamics (including issues of power and gender) that often arise when early adolescents interact in a group setting. Because of these developmental issues, middle school teachers might structure group activities into the curriculum as a motivation. However, cooperative-learning strategies would need to be very carefully implemented and monitored, with an eye toward gender dynamics, student relations (respect versus bullying), and developing a sense of community.

Because of these early adolescent developmental considerations, a middle school classroom might be built around issues of ethics, character, and community as much as around content areas. However, simultaneously, whether students believe they are academically viable also looms important: It is often during the middle school years that learners gain a sense of themselves as good or bad at school. Thus, a teacher might work to ensure that the social context for learning is a supportive one by maintaining fair and equal expectations, avoiding publicly "singling out" students, and providing opportunities for adolescent learners to be involved in tasks with support from more experienced, knowledgeable others.

Late Adolescence to Young Adult

At the high school level, individuality often plays an increasingly important role in a learner's development. Students at this level also often begin to place their individuality within a global context. While peer acceptance remains prominent, decisions associated with adulthood—life and career paths—begin to share center stage. More clearly defining who one is and what one believes in (identity development) occur in concert with decisions about work and school (career development). Aware of these developmental factors, a high school teacher might make room in the curriculum for student choice, including options for students to take action in the world based on the content the class is exploring. Instruction might be differentiated based on individual student interest and need, encouraging students to explore a

wide range of options. In contrast to a focus with early adolescents on group relations and social and moral development, instruction with late adolescents might utilize the group as a support structure to enhance individual exploration and achievement. Though more a time of individuality, peers continue to play an important role for learners at this age in developing a sense of sexual, cultural, and ethnic identity.

The Development of Adult Learners

While educational thinkers like John Dewey were very influential in shaping developmental approaches toward instruction of children in the early half of the twentieth century, recently more attention has been paid to developmental approaches to instruction of adult learners. This has occurred in concert with the rise of adult learning programs, and the increasing number of adults who return to school later in life.

Attention to the developmental path of teaching adults often considers the “identity threatening” (Kegan 1994) aspects of learning. In order to learn, one must change. The longer one has been alive, the harder it often is to change—because learning often means a fundamental reconstituting of self and a lifetime of thinking in a particular way. Teachers who are cognizant of adult learner identity would approach instruction thoughtfully, with respect for current student understandings and worldviews. Rather than seeking radical shifts or reversals in thinking, instruction would be geared toward developing new “trajectories” of understanding. Aware that resistance is common in the developmental process of adult learners, teachers might validate existing views even as they ultimately work to help the adult learner consider multiple alternative viewpoints.

It is the ability to weigh multiple viewpoints that is often considered to be on a higher developmental level. For example, in order to consider issues of multiculturalism and culture, some claim that one must first realize that his or her own beliefs are culturally constructed and that other people have different culturally constructed beliefs (King and Shuford 1996). In fact, it is helping adult learners to consider multiple viewpoints and to see their own beliefs as distinct but limited views of the world that

are often the primary goals of a developmental approach to adult learning.

Later in life, as a learner’s physical faculties may wane, instructors of older adults often need to consider additional factors that impact learning, including visual and aural challenges. For example, elder learners with sight difficulties may need to be provided with large print or books on tape to more fully engage in the learning process.

DEVELOPMENT IS DIVERSE

In considering these generalizations about the relationships between age and developmental phases, it is important to keep in mind that such phases are not fixed. For these considerations to be meaningful guides for instruction, it is important to recognize that individual learners may experience things quite differently because of diversity in life experiences and contexts.

For example, while we might assume that older people can concentrate for longer periods of time on a given task, specific motivational conditions may contradict this: a six-year-old that is highly motivated to ride a bike will likely be able to concentrate for longer than the thirty-five-year-old who is trying to learn a new mandated email program he has no interest in using. Social conditions are also a significant consideration: A twelve-year-old who lives in poverty and takes care of her siblings while her caregiver works away from home to earn money may have already taken on responsibilities and dispositions associated with adulthood. Furthermore, certain human needs, such as belonging and attention (Maslow 1968), often span a lifetime, and thus continually impact instruction regardless of one’s age. Levels of comfort or distress, senses of competence or failure, excitement or boredom, or passion and heartache that are experienced in instruction can be as real and significant for the three-year-old, the thirty-five-year-old, or the ninety-year-old. Developmental information may be considered as one of many important pieces of data—and part of a much larger picture—that a teacher may draw from to ascertain the best approach to instruction for a given group of students or for an individual learner.

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SUBJECT MATTER AND INSTRUCTION

A host of societal, educational, and contextual issues influence teachers' approaches toward subject-matter instruction. Influential contexts include teachers' personal orientations toward curriculum, their teaching-and-learning knowledge base, school and subject-matter departmental perspectives, state and national teaching frameworks, and state policies toward standardized testing, to mention a few. Two of the more important organizational factors impacting instruction are grade level and, at the secondary level, subject matter.

SECONDARY INSTRUCTION AND THE DISCIPLINES

At the secondary level (usually grades 6–12), the focus of instruction often shifts. Instead of remaining with one teacher all day in the same classroom, students now begin to study individual subjects in separate classrooms. There is a range of ways in which secondary teachers approach their subjects and their students. Some secondary educators teach their subjects in relatively didactic and lecture-based ways, similar to teaching approaches that they may have experienced themselves in college courses. The division of the curriculum into academic disciplines and the separation of secondary teachers into individual classrooms encourage such didactic approaches. Other secondary teachers work to support student growth and learning in ways more often related to a specific academic discipline (e.g., mathematics or history). In addition, students' critical and abstract thinking, development of multiple perspectives, and ability to learn collaboratively often occur embedded within a particular academic focus.

How teachers view their academic discipline, and the instructional approach they use to promote student learning and growth within it, varies widely on the secondary level according to discipline as well as views of pedagogy (educational approaches). Some teachers consider their subject matter as factual content and favor the use of traditional didactic teaching methods, such as lecture with individual student follow-up work. Other secondary teachers

view the subject in a more open-ended and dynamic way and favor more authentic teaching and learning approaches.

An authentic learning situation is one that either takes place in a real world setting, or simulates one in the classroom. With such instruction, students often learn specified academic knowledge and skills (subject matter learning outcomes) in an apprentice-like situation, or with the learning outcomes highlighted within the authentic experience. For example, in ninth grade science, students might learn knowledge and theories about stream ecology as they work in real streams outside the classroom. Within this approach, the learning outcomes can be defined in the course of the learning situation, thus *emerging* from the disciplinary inquiry. In some examples of authentic instruction (and less frequently in didactic teaching), students and teachers may discuss and negotiate the learning goals and outcomes.

A form of authentic instruction seen on both the elementary and the secondary levels is contextual teaching and learning. Contextual teaching and learning is an approach that helps teachers relate subject matter content to real world situations and motivates students to make connections between knowledge and its applications to life outside school. The approach also emphasizes student problem solving within a real-life (authentic) context, encourages students to become self-regulated learners who learn from each other, and employs authentic assessment (Pierce and Jones 1998).

On the secondary level, individual teachers use multiple instructional approaches to develop a repertoire. For example, many high school mathematics teachers may follow a traditional instructional model of presenting clear formulas and step-by-step computational methods to their students before having them practice similar formulas. But the same teachers may also support a current goal in mathematics instruction of promoting their students' problem-solving and conceptual understandings (National Council of Teachers of Mathematics 1989). In order to promote such mathematical conceptual understandings, teachers might have students extend and apply mathematical knowledge to real life situations and solve nonroutine problems with a variety of mathematical methods (Runesson 1997). While students may be encouraged to share individual proofs and problem

solutions, this type of instruction often underscores the goal of maintaining the integrity of the soundness of mathematics, through the plausibility of the conjecture or the solution (Ball 1995).

One goal of instruction in history is to promote students' ability to think historically. Historical thinking is a concept with a number of characteristics. It implies that students can reason from primary and secondary documents, interpret historical events in accurate ways, create historical narratives from multiple perspectives, and begin to understand immediate and underlying causes of events. History instruction can also be said to have a "scientific" component (Turner-Bisset 2001). History teachers frequently have students:

- Frame historical questions
- Collect/analyze evidence and historical findings
- Place understandings into historical/global contexts
- Develop content understandings and historical narratives

History teachers often rely on problem-based learning to promote their students' understandings in these areas.

History instruction may also involve a literary aspect in which students communicate their historical understandings in a variety of ways (Turner-Bisset 2001). To communicate such understandings, students might create extended writings, productions of historical accounts, and/or reconstructions of past events and lives. Teachers may encourage students to communicate their historical understandings through drama, role-playing, simulations, storytelling, and story writing. Students may summarize with pictures, videos, or reports.

Secondary English instruction often includes a focus on having students learn to read critically and imaginatively, write, communicate orally, listen critically, and critique and analyze uses of technology and the media. English and Language Arts teachers frequently promote their students' development of these skills and understandings through engagement in literature. For example, an English teacher might engage students in an instructional unit on persuasion and freedom of expression. Inclusive in this unit is the intent for students to develop cognitive and creative/critical skills related to seeing multiple

perspectives, to place literature within a social context, to develop their own writing voice, and to learn to anticipate and refute the opposing argument and understand one's own argument. Students might examine the concept of freedom of expression both by creating their own texts and by reading existing texts, including Shakespeare's *Julius Caesar* and selected writings that look at voice and expression from a variety of perspectives (e.g., *Lenox Avenue Mural* by Langston Hughes, *Ain't I a Woman* by Sojourner Truth, and *Declaration of Sentiment* by Elizabeth Cady Stanton).

The instructional details of this unit might begin with students brainstorming controversial topics of importance to them as teenagers (e.g., the establishment of the draft, the legal age to consume alcohol, curfew). The class then selects a topic as a whole or in small groups, brainstorming arguments both for and against their particular issue. Then, as a class the students write a persuasive essay, using their arguments both to support their position and to give them insight about opposing perspectives, which they have to refute. After they write their essay, the students take part in a controlled debate on the same or a similar topic. This might be followed by having students read, analyze, and discuss two classic texts that use different approaches to persuasion: *Ain't I A Woman* and *Declaration of Sentiments*. The unit might conclude with a reading and individual written analysis of the play *Julius Caesar*, with an emphasis on persuasion and freedom of expression. Exploring the relationship between identity and freedom, this unit is intended to create mutual support between reading, writing, speaking, listening, and understanding technology, and to promote cognition, and critical-and-creative thinking skills. It also is intended to create a sense of student growth and empowerment, in personal, societal, and literary terms. Finally, the unit is intended to facilitate student self-reflection.

Another approach seen in secondary instruction is having teachers from different content areas work together to create interdisciplinary instruction. In an interdisciplinary design, teachers in at least three separate subject disciplines team-teach in an integrated thematic unit. The unit is considered integrated in that no one particular subject dominates the unit, and it is considered thematic when a particular theme becomes the organizing center of the unit. Examples of organizing themes are "flight"

and “intelligence.” The interdisciplinary design itself must be valid in terms of supporting the individual discipline. Interdisciplinary design allows teachers to instruct in authentic ways that cross disciplinary boundaries, as frequently occurs in real-life learning situations (Jacobs 1989).

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GROUPINGS ISSUES IN INSTRUCTION

A critical component of organizing for instruction is considering how best to group learners. Different grouping structures offer possibilities and challenges to the learning context. It is important that instructors have clearly in mind what they intend learners to experience and thus what is the most suitable arrangement to enable this. It is also important to continually assess the suitability of grouping structures to determine whether or not they are meeting learners' needs, and to be flexible and willing to change the groupings when appropriate.

Different groupings create different learning opportunities for students. It is important to closely align the goals of instruction with appropriate group structures. Implementing a variety of group structures within any one learning context and continually varying these can create an interesting and effective learning environment. Implementing flexible groupings in which the composition of group members and the duration of groups change according to student needs can also maximize learning. Whatever grouping structure is chosen, it is critical to remember that group processes for group members will not be intrinsically known and therefore need to be explicitly taught. Grouping arrangements can have unintended consequences such as developing a social stigma or lowering student expectations and performance. It is important, therefore, to continually keep in mind both the intended, and perhaps unintended, social and academic consequences of any grouping decision.

Some key concepts to consider in structuring group arrangements are: (1) whether to create cooperative or competitive groupings (or some combination of each); (2) group size (i.e., whether to have individual

activity, dyads, small or large group formats); and (3) whether groups will be formed on the basis of homogeneous or heterogeneous ability.

COOPERATIVE OR COMPETITIVE ARRANGEMENTS

There are three main ways to structure student learning environments. One way is to create an individual learning environment in which students have personalized learning goals and are encouraged to work independently. In an independent arrangement, students do not typically need to share information with each other, and they do not need each other's input to complete learning tasks—any interactions with other learners are typically of a social nature. Students may be working on similar or different tasks; however, the underlying concept is that they are working alone and are assessed alone. Two alternative set-ups to the individualized learning environment are the cooperative and the competitive arrangements. In a cooperative arrangement, students work together toward a common goal. They assist each other and are responsible for learning materials both individually and collectively. In a competitive arrangement, students typically work alone or in small groups and are compared against each other.

Cooperative grouping can be used at any level and for many purposes. Cooperative tasks can involve learners working together on the same tasks (such as all talking together, manipulating materials, or figuring out a mathematical solution) or it can involve learners each working on a different task that contributes to a common whole (for example, creating different pieces of a model that will be put together to form a complete model). An example of learners participating in separate tasks within a cooperative learning context is commonly referred to as the “jigsaw” method (for more information, see Johnson and Johnson 1994). Using the jigsaw method, a teacher might assign each student a section of a text to read, and then have students share what they read with other students thus enabling everyone to have access to the whole text.

One of the benefits of cooperative grouping structures is the opportunity for students to learn with and from their peers in the learning context. One specific structure to facilitate this type of instruction is peer tutoring. Peer tutoring involves students learning from their peers in a structured situation. It can

be structured as same-age or cross-age tutoring. Same-age tutoring involves a tutor, who has a more advanced understanding of the material, working together with a tutee. Cross-age tutoring involves a tutor and tutee of different ages, with typically the tutor as the older student.

Research indicates that cooperatively structuring peer tutoring can be an effective means of instruction for young people because of heightened peer interaction. This might be because young people can be considered cognitive equals and are more able to share an element of “cognitive closeness” or “cognitive congruence.” Thus, tutors may be better able to understand the difficulties tutees encounter. For example, for a ten-year-old tutoring a six-year-old in writing, it has not been long since the tutor learned to write, perhaps better identifying with the tutee and providing helpful strategies. Put another way, tutors can remember “being there.” Another consideration here is that peers often tend to “speak the same language” and might find it easier to engage in effective dialogue and find relevant and meaningful ways of explaining concepts to their peers. Peer tutoring can be an effective way of providing one-on-one instruction and attention within a larger class environment. Research shows that in a well-structured peer-tutoring context, both the tutor and tutee can make social and cognitive gains.

GROUP SIZE

There are many different configurations that can be made in terms of group size, and this impacts both what people learn and how they learn. The major configurations might be considered to be dyads, small, or large group structures. It is important to keep in mind that one may use dyads, small groups, and large group activities within the same lesson and that this ability to be flexible and to change instructional groupings can help students who work better in different settings. Changing the grouping arrangement within a learning context can also add a variety that can be critical in maintaining student attention and engagement.

Dyads

Dyads involve two learners working together, often within a larger learning context. Dyads can be set up as a one-on-one teaching situation (as in peer tutor-

ing) or can exist on a more equal footing where both participants are learners and neither has the role of being the “teacher” or “expert” in the learning situation. One example is the “pair/share” strategy. This instructional strategy involves learners talking or working with one other person in a dyad before sharing their learning experiences with the whole group. This provides the opportunity for everyone to talk and be listened to, as well as rehearse and try out their ideas before articulating thinking and ideas to a larger group. Dyads can function to create a safe and smaller environment within the larger learning environment.

Small Groups

Group sizes of six to eight participants have been found to maximize the benefits of having multiple perspectives and expertise (synergy) while enabling everyone to participate. Such a group size has also been shown to be beneficial in terms of minimizing “process losses”—time needed to organize people and strategies for the group. However, group sizes that are even smaller (e.g., three to four participants) tend to increase the participation of the members of the group because it is harder to “get lost” and easier to have one’s voice heard in a smaller group. Group size is an important instructional consideration if maximizing student participation within a group is one of the goals of a particular learning event.

One specific method used to increase learner participation in groups is to assign roles. For example, in reciprocal teaching (Palincsar and Brown 1984) a student takes the role of leader and leads the group through the processes of clarifying, questioning, summarizing, and predicting about text before turning over the role to another group member. In this way, the leadership continually moves around the group and the leadership role is clearly defined. Other roles—such as recorder, researcher, timekeeper, and speaker—can be integral to the group learning process. However, often these skills need to be explicitly taught, particularly when students have had little practice with such group dynamics.

There are many compelling reasons for organizing learners in small groups. Small group instruction can facilitate the ability of instructors to intentionally design instruction for the specific needs of individual group members. It can provide a small, socially

supportive learning context in which learning and teaching can focus precisely on what the students need to learn next in order to move forward.

Large Groups

Large group settings tend to require teaching to be the same for everyone. Typical large group settings include lectures and instruction wherein learners are all working on the same material. Large group settings can be an effective way to attend to a large number of people in a time- and cost-effective manner. This approach can be a time-efficient way to share information that is not too challenging or contentious. Large groups can also be formed for motivational or energy reasons, the intention being to create a critical mass of interest and energy. However, when material becomes more challenging, learners often need to have opportunities to struggle with the material, to interact with others, and to ask questions. This can be difficult to support in a large group setting; however, within a large group setting one can incorporate activities such as the dyad “pair/share” arrangement discussed earlier.

HOMOGENOUS AND HETEROGENEOUS GROUPING

Groups may be considered homogenous or heterogeneous based on several different factors. One might consider age, interests, academic skill, social background, physical abilities, preferred learning styles, or any number of factors. It is important to consider the makeup of any group and the possible effects it will have on all learners when planning instruction.

Sometimes groups are intentionally planned to be heterogeneous. Heterogeneous groups may be constructed on the basis of instructor knowledge of students, or by the students themselves. An example of a student heterogeneous group formation strategy is the “max mix” strategy in which participants themselves have to get into groups that they see to be the most diverse over as many dimensions as they can think of.

One of the most common grouping criteria is commonly referred to as “ability grouping.” Ability grouping involves creating grouping arrangements that are made up of students who are believed to be similar in the skills that are required for particular instruc-

tion. For example, ability grouping might be based on academic skills in reading, or physical-motor skills in physical education. The most common ability grouping that occurs in schools is based on broad judgments regarding academic skills. Ability grouping is usually created as either within-class or between-class.

Between-class grouping involves providing different classes for students with different abilities. These groupings are often made on the basis of scores in standardized tests. A critical issue to be conscious of in relation to the sorting of students on the basis of standardized test scores is the cultural bias that can be present in such exams. Thus, sometimes between-class grouping functions to shut out certain groups of people from higher ability settings.

A further problem that can stem from between-class ability grouping is the tendency for the quality of instruction provided in lower ability classes to be less than that provided to higher ability classes. This “self-fulfilling prophecy” affects learners when teachers have lower expectations of students positioned in lower ability classes. The lower expectations of the teacher can impact the achievement of students who would attain at a much higher level if expectations were higher. Between-class grouping can also cause social problems for students, as they may feel stigmatized by their membership in a particularly high- or low-ability class.

An alternative to between-class grouping is within-class grouping wherein ability grouping occurs for short time periods and is flexible. Within-class grouping creates clusters of students within a whole class based on perceived ability in relation to the specific subject or content to be learned. For example, several groups within the class might be formed based on comprehension skills in reading, oral language presentation skills in drama, computational skills in numeracy, or spatial understandings in geometry. As these examples illustrate, different ability groups might be created within the same curriculum area, like language arts or mathematics. Within-class ability grouping allows for more targeted assessment and grouping decisions based on specific skills in contrast to the more broad attributes often considered in between-class grouping. It is important to keep in mind that while within-class grouping can reduce the sometimes stigmatizing effects of between-class permanent group-

ings, students are often still aware of the reasons for grouping and steps need to be taken to avoid stigmatizing effects within the classroom.

There are opportunities and challenges inherent in both homogeneous and heterogeneous grouping arrangements. One of the advantages of homogeneous ability grouping is the opportunity for students to work on similar material at an appropriate level. A drawback is that less skilled students are all together and do not interact with more highly skilled students. This reduces the opportunity to learn from peers, have role models, and see images of what is perhaps appropriate behavior. It is important to keep in mind that whether learners are considered to be homogeneously or heterogeneously grouped, there will still be a range of skills within the group. In other words, both homogeneous and heterogeneous groupings contain a range of abilities that impact instruction.

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CONTEXTUAL ISSUES IN INSTRUCTION

Instruction is embedded in larger contextual issues that are critical to examine when planning, implementing, and evaluating instruction. These contextual issues can be described as the cultural, economic, political, and social contexts of the learner. In many places, these realities reflect the views and norms of the dominant culture. Often, however, the norms and expectations of this dominant group do not meet the needs of many learners. The learners whose needs are met tend to be those who are most closely aligned with the dominant culture; thus, considerable inequities in access, experiences, and outcomes from instruction can exist.

Cultural, economic, political, and social contexts can have a significant impact on both the instructional situation and outcomes. Instructors who are aware of these and address them in their planning and implementation of instruction are more likely to prevent inequalities in schools, and by extension, society.

CULTURAL CONTEXTS

Cultural stereotyping is important to be aware of when planning instruction and considering learners. Stereotyping can happen in several different ways. For example, stereotyping can happen when an instructor has different expectations of the performance of students based on socioeconomic class or race. It can also exist when an instructor uses materials in their teaching that contain inaccurate stereotypical images. Educators need to be careful not to stereotype learners based on cultural group affiliation. Large differences exist within groups and stereotyping can promote inaccurate and harmful information. Teachers should be cognizant of their expectations for students and ensure that they are helping all students reach their potential.

Learning contexts can affect whose culture is represented and acknowledged in instruction. People tend to do better in instructional situations when they can see and experience their own cultural values reflected and present in the curriculum, instructors, and exceptional peers. Instruction geared toward these ends can be said to be taking a multicultural stance, which confronts inequities in schools and societies. As Sonia Nieto (2001) explains, multicultural education needs to be about more than cultural sensitivity—it needs to address deeply ingrained inequities, promote social justice, and be accompanied by equal access to resources.

Individuals belong to many cultures based on, for example, ethnic origin, race, religion, gender, age, class, native language, geographic region, and abilities. Individuals who belong to certain cultural groups (for example, able-bodied, heterosexual Caucasians) tend to carry more cultural capital into many instructional settings in North America. Instruction is often designed to meet the realities, experiences, and needs of these people to a greater degree than those outside the dominant culture.

In instruction, there is a growing recognition of the need to account for these contextual issues and to find ways to address them in order to provide learning opportunities that have the potential to meet the needs of all learners, and to break oppressive power relationships. The cultural capital (see Bourdieu 1984) that students bring with them to the learning situation can have a direct influence on how successful they are in any instructional setting. In-

structional planning, implementation, and intended outcomes need to meet the needs of people who have different religious beliefs, who are from diverse ethnic backgrounds, who speak different languages, and who identify as being differently abled.

Historically, the theory of assimilation has been used to define and justify instructional methods. In North America, assimilation theory typically assumes that all students and teachers should conform to the unwritten rules of the Anglo-American, able-bodied, Christian, middle class, English-speaking culture, regardless of individual cultures or groups to which students and teachers actually belong. If we examine many instructional settings today, we find that this assimilation theory explains what students experience. The instruction is indeed often designed towards the needs of people who fit neatly within these categories. Many people do not fit all of these categories, and some people do not fit any of them. Instruction that is designed on the theory of assimilation can therefore promote inequalities and injustices to those whose cultural groups are not represented by these categories.

The theory of assimilation exists alongside the deficit theory. Deficit theory views differences between people as problematic and a fault of the individual. From the perspective of the deficit theory, cultural diversity is a problem rather than an asset. Those who do not conform to the expectations of the dominant culture in North America are viewed as having a deficit. The responsibility for failure in instructional settings is then unfairly placed on these individuals when all students receive the same instruction and are treated in the same manner.

In contrast to assimilation theory, cultural pluralism or multiculturalism stresses the fact that people have multiple memberships in different cultures and that these memberships and differences might be recognized, and indeed, celebrated. Differences between people are acknowledged as an asset to instruction rather than ignored.

ECONOMIC CONTEXTS

The economic conditions in which people live can affect their views, experiences, and outcomes in instruction. Disproportionately large numbers of students representing lower levels of socioeconomic status (SES) tend, for example, to be assigned to

low-ability groups in a variety of educational contexts, to perform poorly on standardized texts, and to be in educational settings that have inadequate instructional resources. Students living in poverty are more likely to be placed in lower academic classes and to have lower academic expectations placed on them.

There are many other less visible ways in which economic factors can directly impact instructional participation, for example, homework practices. It may not be reasonable to expect the same homework performance from students who spend their hours after school looking after younger siblings in a small apartment while their parents are working to earn enough money for the family to survive, with those of children who have a parent or caregiver at home after school to support them with their homework, a car to drive them to the library, and a quiet place in the house in which to concentrate. At the same time, it is essential that people have equally high expectations of the intelligence and abilities of students with low SES. One dilemma here is that in most places in North America there is a need for more equitable ways of funding schools so that schools have equal access to resources no matter what their geographical location.

POLITICAL CONTEXTS

Political contexts can have a profound effect on instruction through such means as testing mandates. Educational testing is an area that has historically been shown to contain cultural bias. While there is an increased awareness of these issues, there is a need for continual monitoring and critical analysis of test construction, content, administration, scoring, and interpretation. There is generally a need for more culturally valid testing procedures so that students from nondominant cultures are not penalized by earning disproportionately lower test scores.

SOCIAL CONTEXTS

The social context of society also prescribes sex-role stereotypes that can be inaccurate and limiting within instructional relationships. Research indicates that much of the behavior deemed to be male or female is socialized from a very young age. Instructors need to be conscious of the theories and beliefs

they hold with regard to gender role stereotyping and continually work to not create expectations for student achievement on the basis of gender. For example, in Western culture it is often assumed that females are more able at language and verbally oriented tasks while males are more able at spatial and physical tasks. Indeed, research can be found that supports this assertion; however, the underlying issue to be aware of in instruction is the role that different socialization, educational opportunities, and expectations by teachers play in promoting these patterns (see Gilligan 1982).

Discrimination on the basis of perceived special ability or disability is a further way in which instruction can serve to promote inequalities. Instructional contexts must serve the needs of special populations, including both students with special learning needs and students with special learning abilities. There is a tendency for instruction to be aimed at the students who lie between these two extremes and to exclude those on the margins.

Religious beliefs can also have a significant impact on how a person thinks, feels, acts, and learns. Because of this, the instructional situation needs to consider different religious beliefs and the impact of different instructional decisions on belief systems. The first step for instructors here is to be informed about the different religious groups with which learners identify.

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CLASSROOM MANAGEMENT AND PLANNING

One aspect of the contextual factors of instruction is the approach teachers take to manage their classrooms. This is referred to in varying texts as classroom or behavior management, instructional guidance, or learning environment or organizational management. The latter terms refer to the arrangement of the learning environment and instructional practice to guide the behavior and tone within the classroom to assure learning can take place. This is in contrast to classroom or behavior management

where discipline is used to control behavior separate from instruction. Instructional guidance is essentially a more democratic, student-focused approach, whereas classroom management is a top-down teacher-directed approach. As with other aspects of instruction, the best way for classrooms to function is disputed among practitioners and educational scholars.

Teacher-controlled classroom management is typically oriented towards student behaviors that fall outside the norm and are found to be disruptive to the flow of the class. The essential form of management is discipline, with the teacher dictating the rules of behavior and the derived consequences. In more traditional forms, the teacher either rewards or punishes the students for their behavior, attempting to correct the behavior until it is changed. In some forms, such as behavior modification, the rewards and punishments are extrinsic (not tied to the student's long-term goal of internalizing appropriate behavior, but reacting to immediate pleasure/pain stimulus).

One approach that has gained popularity since the early 1990s is Assertive Discipline, where there is no differentiation among students or their behaviors in breaking rules. Any rule broken by any student for whatever reason is treated the same. Typically, the consequences for breaking a rule the first time include writing the offenders' names on the board, then with each subsequent offense, giving them a tick mark until some privilege (such as recess) is lost. Finally, the students' parents are contacted and the punishment is formalized. In some teacher-centered approaches, prevention is key, trying to stem negative behavior before it occurs. Still, with these efforts, little decision making is left to the student. The teacher dominates or controls the environment, and carries out the punishments. The child does not learn how to behave appropriately, but rather to not misbehave per a specific set of rules.

In contrast, learner-centered approaches to classroom management are typically referred to as "instructional guidance approaches" as they focus mainly on getting the students to recognize and internalize appropriate behavior. In one such approach, the community model, students are encouraged to recognize their responsibility to the community of learners to which they belong. They are given rights and privileges that are upheld by the group, not just the

teacher. This model facilitates a caring approach, which encourages the teacher and students to bond with strong personal and professional ties. Unlike other learner-centered models, the community model tries to focus solely on the positive, without logical consequences other than the impact the behavior would have on the relationship of the students within the community and their responsibilities to themselves. Other models such as “reality therapy” and “teacher effectiveness training” focus specifically on the individual child and that child’s needs—socially, emotionally, and physically. There is much communication between the teacher and student to assess the problems that the child is having, as well as sharing decision making in how to rectify them.

As with the debate between traditional and progressive instructional philosophies, traditional approaches are cleaner, simpler, and less time consuming than those that involve focusing on students. The learner-centered approaches look for a long-term solution in which the student learns how to be self-monitoring and in self control. This takes considerably longer than ticking someone’s name on a board or doling out candies as rewards. However, some students, given their behavioral needs, respond better to the traditional behavior management techniques. These are often used in special education classes with children who have specific behavioral disorders. The community model requires a committed group of students and teachers who are willing to find the time and effort to create the environment necessary to build the relationships and self-awareness for children to succeed at being self-monitoring.

PLANNING

Planning is a critical part of instruction, as it involves making decisions ahead of time regarding both the big picture and smaller details of instruction. While plans will not always be followed absolutely during instruction, prior planning means that the instructional flexibility necessary can be informed and relevant. Planning is undertaken before and within instruction to enable teachers to consider what is to be learned, how it is to be learned, what is needed to support this learning, and how to assess what is learned.

Planning may be short or long-term. Long-term planning outlines the big picture for instruction over, for example, a “term” or “marking period.” Short-term planning on the other hand outlines a smaller period of time, for example, a lesson or week of instruction. It is helpful to make a written record of both short- and long-term plans when designing instruction. This enables the instructor to keep the big goals in mind while also attending to important details. Such planning also serves as a form of communication between instructors when necessary.

Planning records might include the goals or objectives for instruction, the description of the learning experiences that students will participate in, and the resources needed. Necessary resources might range from consideration of a suitable site for instruction to the actual materials resources that participants will need. Planning also often includes an outlining of intentions for assessment.

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EDUCATIONAL ASSESSMENT

The basic notion of tests developed to assess particular traits or characteristics of individuals has been present in various cultures for centuries. Historical reviews by Howard Wainer (1990) as well as Hoi K. Suen and Joseph L. French (2003) note early evidence of civil service type examinations in China (2200 B.C.E.) as officials were tested to see whether they qualify to work for the emperor. The Chinese are credited with recognizing early on that samples of behavior, measured under specific conditions, could provide accurate information about abilities and skills possessed by an individual. This information could be applied in other settings to determine the best vocational placements for officials. China instituted tests of archery, arithmetic, horsemanship, music, writing, as well as social graces, to be used in selecting candidates for various offices.

Large-scale testing in the United States and Europe began in the late nineteenth century with a focus on assessing intelligence, achievement, and other ability areas related to personnel placement. However, the major impetus for what is often called the psychometric movement was the development of the Army Alpha and Beta tests used to place army recruits in World War I. Nearly two million men were administered these measures. Since then tests have gained strong credibility in American society as an objective and efficient means for obtaining information regarding characteristics of individuals being assessed. The mental testing movement spurred research and test development in a variety of areas including: intelligence, academic achievement, physical attributes, personality, interests, and attitudes.

Since World War II, a wide array of measures have been developed and published. The Buros Institute for Mental Measurement has been producing the *Mental Measurement Yearbook* since the 1930s (Plake, Impara, and Spies 2003 is the fifteenth edition). This publication is designed to help consum-

ers by providing reviews of all published tests. Reviews are written by experts in the field and cite the most current publications related to a particular measure's test construction, reliability, and validity. Originally published in book form only, this information is now also available online for easier accessibility (see www.unl.edu/buros).

The field of educational assessment has grown exponentially given the emphasis placed upon accountability in educational practice, changes in test theory, and technological innovations. Differences in opinion surrounding what constitutes quality education and related standards have led to controversy with respect to appropriate assessment practices. The proliferation of new measures for school-age populations also attests to the importance of tests in assessments of a variety of constructs related to growing educational demands.

Tests and other alternative forms of assessment have been identified as the gatekeepers to educational opportunities and services. This is especially evident with respect to achievement and aptitude measurement. Students who score high may be eligible for gifted programs and resources allocated for students with high potential. Those who score lower than their assessed potential may be deemed eligible to receive special education services.

It should be noted that the term testing refers primarily to the act of administering, scoring, and interpreting a sample of behavior obtained through a particular data-gathering method. Ronald J. Cohen and Mark E. Swerdlik (1999) define a test as a measuring device or procedure. The term assessment is much broader, encompassing not only the notion of testing but also any form of systematic data gathering within a particular context. Alternative assessment refers to any data-gathering method that detracts from the typical standardized approach to measurement (i.e., authentic assessment).

Legal controversies have arisen about the usage of tests in the educational arena. Some of these include: tracking of ethnic minority students, accusations of bias within intelligence and other aptitude measures, and appropriate testing practices for examinees with disabilities. The ethical codes of many professional organizations (e.g., the American Psychological Association and American Educational Research Association) include guidelines addressing appropriate test development and application in terms of test development practices, publication (e.g., advertising), test usage, validity, informed consent, privacy, reporting of results, and competence of the examiner.

Educators and researchers have continuously emphasized the importance of the assessment process rather than having a sole focus on test scores. However, as will be noted in the entries that follow, priority has often been given to the results of standardized measures, rather than more flexible and informal methods of assessment. Educational assessment implies a focus not only on formal testing but also informal methods of obtaining information about an individual or group. This chapter will cover various assessment methods used in the educational arena, specifically:

1. academic outcomes
2. adaptive testing
3. authentic (informal) assessment
4. computer based testing
5. criterion-referenced testing
6. evaluation
7. high-stakes testing
8. norm-referenced testing
9. teacher assessment
10. test development
11. test theory

The areas addressed are not mutually exclusive, and there is the potential for considerable overlap between them. Attempts have been made to minimize redundancy and to cross-reference between entries when necessary.

The entry on academic outcomes highlights the different ways in which achievement and other indicators of educational benefit are assessed. Attention is given not only to standardized measures of achievement and aptitude but also intervening variables that impact academic performance.

The entry on adaptive testing provides an introduction to the computerized testing section. Adaptive testing was viewed as promising during its early inception with respect to individual testing, however, its development remained dormant until the advent of computers. Computer adaptive testing has become very popular, impacting not only the types of measures that are being developed but also leading to changes in test theory.

The entry on authentic (informal) assessment provides alternatives to traditional standardized testing. The strengths and limitations of various methods encompassed by the authentic assessment label are noted, and specific attention is given to portfolio assessment as one of its most popular.

The discussion of computerized testing highlights how technology has impacted the assessment area. New computer programs have increased the potential of computer-based testing to encompass test administration, interpretation, and report writing. Strengths and limitations of the computerized testing movement are noted.

The entry on criterion-referenced testing describes the unique considerations of this type of measurement. Criterion-based tests have gained in popularity with the rising emphasis placed on standards-based accountability. Specific attention is given here to understanding the differences between criterion-referenced and norm-referenced testing.

Evaluation at both the individual and programmatic level is highlighted in the subsequent entry, with attention given to special education evaluations as well as those of the gifted. The process of expanding evaluation to the programmatic level is also discussed.

The high-stakes testing movement has been influenced by political agendas. The strengths and limitations of this phenomenon are covered, and the historical context of the movement is also outlined. Specific attention is given to the impact of high-stakes testing on marginalized and oppressed groups within society.

The entry on norm-referenced testing highlights some of the characteristics of the most common types of measures administered in educational settings. Applications to particular assessment areas are noted (e.g., achievement, aptitude). Statistical concepts related to norm-referenced tests are briefly discussed.

The increasing emphasis placed upon accountabil-

ity has led to not only high-stakes testing with students but also with teachers. The area of teacher assessment focuses on different types of assessment and issues of development from novice to expert in relation to those types of assessment are discussed.

The test development segment is divided into five stages related to construct definition, item generation, administration of a test development sample, item analysis, and establishment of reliability and validity. Though primarily focused on traditional standardized testing, implications for alternative assessments are also noted.

Test theory has undergone changes since the evolution of the computerized testing movement. This entry describes classical test theory, item response theory, and contemporary issues in relation to newer theories and growing statistical sophistication.

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ACADEMIC OUTCOMES

The most often-used criterion to measure academic outcomes is school performance. Other measures of academic outcomes include behavioral indicators of attitudes toward school, school attendance, school adjustment, level of school engagement, and educational aspirations (see the website of the American Psychological Association [n.d.]) for examples of school-based intervention programs and the academic outcome measures used by them). Various members of the school system, such as teachers, guidance counselors, school psychologists, students, and individuals and groups outside the system, including parents and state and national testing services, can assess academic outcomes. This entry focuses on school performance in terms of the prominent role given achievement measures in determining school success. Other related areas of academic outcome, such as attitudes toward school, school attendance, school adjustment, level of school engagement, and educational aspirations, are also discussed briefly.

SCHOOL PERFORMANCE

School performance is a primary academic outcome. It can be measured in a number of ways, including

academic achievement and realization of goals in age-appropriate domains of development.

The terms achievement and aptitude are sometimes incorrectly used interchangeably. As a part of school performance, achievement refers to accomplishments that are a result of specific educational experiences. Aptitude, on the other hand, refers to an individual's existing psychological characteristics that may be used to predict differences in future learning under particular conditions (e.g., intelligence). Other entries in this chapter cover assessment methods, including authentic assessment, norm-referenced, and criterion-referenced testing. The following is a discussion of how these methods are used to determine educational outcomes.

Performance on achievement tests is the most frequently cited indicator of academic achievement (Alkin 1992). Students take achievement tests throughout their schooling and these measures vary in format from fixed response items (e.g., true/false and matching) to constructed response questions (e.g., short answer, essays, lab experiments). Achievement tests can be interpreted using norm-referenced interpretations (a comparison of an individual's score to that of others) or criterion-referenced interpretations (a description of an individual's performance; e.g., what they are and are not able to do successfully).

There are a number of popular achievement tests that are administered to groups or to individuals. The interested reader can consult Janet Lerner (2000) for a listing of many commonly administered criterion-referenced and norm-referenced achievement tests. The type of test given is determined by the information being sought. There are certain exams that might be seen as "gates" to the next grade; therefore, an educator might be interested in knowing which students are prepared for promotion based on some defined criteria. They might administer some form of criterion-referenced assessment to learn what level of competency each student has attained in specific areas (e.g., state standards on reading skills). Students who demonstrate a predetermined level of competency are allowed to move to the next grade. Other students are often retained automatically or provided some form of intervention (e.g., remedial teaching) to allow them to achieve a sufficient level of competence in order to be promoted.

Either as an alternative to criterion-referenced assessment or a supplemental measure, educators might also administer norm-referenced tests to determine how a student performs relative to his or her peers. Based on a student's relative standing in the normative group, educators may decide whether a student needs to be retained, requires additional support services, continues with their current course of study or should be placed in a more challenging (e.g., gifted) class. Additional information on this topic can be found in the entry on norm-referenced assessment.

Achievement tests of this type often assess particular skills (e.g., reading, math, social studies knowledge). Reading is perhaps the most critical skill for a student to develop. Their ability in this area can impact their functioning in virtually all other aspects of both school and life. Therefore, assessing skills in this area are critical and this is illustrated by the plethora of reading measures published today.

Reading is a complex task that involves various component skills. In a simple model of reading, these abilities include word recognition, vocabulary knowledge, and reading comprehension. In addition, there is a developmental aspect to its acquisition, leading to a shift in the primacy of certain skills over the course of an individual's education. In the early stages of reading acquisition, students are involved in developing strategies for effective word recognition or decoding and listening comprehension. Assessment at initial stages may focus on areas of letter recognition, phonological processing, and initial sight word knowledge. Students need to be able to recognize words in order to make sense of what they are reading. A child's listening comprehension may also be assessed at this stage. As these word recognition skills become more automatic, other abilities gain primacy in their impact on overall reading achievement. These include vocabulary knowledge and reading comprehension skills (e.g., identifying main ideas, inferential reasoning). Each achievement test may emphasize different abilities, use different formats, and assess different ages. Therefore it is incumbent upon the educator to research the test to insure that it meets the needs of the information being sought and is appropriate for the population being assessed. Popular achievement tests include norm-referenced measures such as the Woodcock-Johnson-III and the Wechsler Individual Achievement Test-II. Popular

criterion-referenced measures include Key Math-Revised and the Standard Reading Inventory.

In secondary schools, state and nationally standardized tests are administered that measure achievement and the scores on these tests are another indication of school performance. These measures include high-school exams that are administered nationally as well as tests given by the state and/or school district in various content areas. An example is the New York State's Regents Exams program. These exams may be administered at any grade level in different subject areas such as biology, American history, algebra, and so on. In the past, states such as New York have also required students who do not show proficiency in these subject area tests to eventually pass a minimal competency exam in specific skill areas such as reading, mathematics, and/or science in order to earn a diploma. It should be noted however that some states such as New York are moving to eliminate their minimal competency exams and will eventually require all students to pass more stringent subject exams in order to earn a diploma.

Other measures of academic outcome include the Scholastic Aptitude Test (SAT) and the American College Test (ACT). These tests assess a person's knowledge base in a particular subject and the ability to apply that knowledge. The SAT-II assesses students' skills in twenty-two different subject areas. It is used by universities to determine a student's level of proficiency in a given area and can be used for both acceptance criteria and placement. The other nationally administered test is the ACT, which assesses skills in four areas: English, reading, math, and science. The California Achievement Test (CAT) identifies students' educational strengths as well as their instructional needs. Colleges and universities also use achievement tests to place students in courses that correspond to their current level of achievement in a content area. The Advanced Placement Test (APT) is one such example. High-school students who score well on APTs in certain areas (e.g., Spanish, calculus) may be given college credit for their achievement and might be waived from entry-level courses in those areas.

Another form of achievement test includes those created by teachers or by the publishers of course textbooks. These are perhaps the most frequently administered tests in elementary and secondary schools. These tests cover a specific range of mate-

rial that has been drawn from class lectures, texts and other written materials, as well as the school's curriculum or standards. These tests are assigned grades by teachers and these grades are equated with academic achievement (or lack of it). Given their intent, they are closely aligned with criterion-referenced tests because they are meant to assess competency in a select area. Similar to other criterion-reference tests, all students could conceivably obtain the same score or ranking. In addition, the teacher can use this information to determine to what extent an individual student or the class as a whole benefited from what was taught. This information can be used to determine whether changes are required with respect to the method and/or pacing of instruction or the type of assessment utilized (e.g., multiple choice format, short answer, etc.). It can also identify students in need of additional support.

Grades on both teacher-created achievement tests and externally mandated standardized tests impact both grade promotion and graduation. Successful completion of current grade, grade promotion, and graduation are considered indicators of academic achievement. In New York State, for example, controversy has arisen because grade promotion is determined by a newly instituted statewide exam. If students do not pass the exam, they have to repeat their grade. This is seen by the state as a fair assessment for all students. There is concern, however, that the statewide exam is an unfair assessment for students who have fewer resources at their schools and homes (e.g., low socioeconomic status [SES]).

Another measure of school performance is students' receipt of honors and awards (e.g. acceptance in an honor society). Students who successfully fulfill the requirements of an honor or award are most often also achieving in school in other ways.

Although school performance is most often associated with grades on exams, grade promotion, and graduation, successful attainment of goals on various domains of development (such as peer interactions, learning behaviors, and acquisition of appropriate social skills) are also key indicators. Researchers have found that social and emotional development is an important academic outcome and influences other outcomes (e.g., positive peer relations has been found to influence educational attainment).

ATTITUDES TOWARD SCHOOL

Gaining an estimate of a student's motivation may be viewed as an academic outcome. Based on their educational experiences, assessment of how motivated students are to continue learning, and whether they are applying themselves in coursework, is critical information. In addition, the degree to which they believe in their ability to succeed may impact school performance. According to attribution theory, assessment outcomes that imply that results are solely or mainly due to ability may lead to lower motivation and potentially less academic success. This has been shown to affect both students and teachers (Rosenthal and Jacobson 1992). Motivation as it relates to failure, particularly with learning disabled students, can be effected by poor performance on tests.

SCHOOL ATTENDANCE

School attendance is considered to be a desirable academic outcome. Truancy is defined as a parent or child's willful noncompliance with state attendance policies and is correlated with problem behaviors and a higher dropout rate (Finn 1989). Some argue, however, that attendance should not be considered an academic outcome on its own and students should only be required to attend school until they have achieved specific educational outcomes or standards. Absences can lead to other undesirable academic outcomes, such as lower or failing grades (Duckworth and deJung 1989). Attendance also influences level of school engagement. For example, greater school attendance sustains students' identification with their school and reinforces a sense of obligation as a member of the school community (Finn 1989).

SCHOOL ADJUSTMENT

Positive adjustment to the school environment is a desired academic outcome. Behavioral indicators of school adjustment include fewer disciplinary referrals by counselors and teachers and less actual disciplinary action (e.g., fewer disciplinary actions for school fights or violence).

Another behavioral indicator of school adjustment would be a decrease in special education referrals made by teachers and counselors. Special education serves students with academic, emotional, and behavioral

difficulties. While some problems are attributed to ability or lack of skills, there may be individual (e.g., low ego strength), familial (e.g., abuse in the family, genetic disposition toward depression) and environmental factors (e.g., a high-crime neighborhood) that contribute to their problems.

LEVEL OF SCHOOL ENGAGEMENT

An additional marker of academic achievement is engagement and involvement in the schools. Engagement refers to active, goal-directed, flexible, constructive, persistent, focused interactions with the physical and social environment, in this case the classroom and the more general school environment (Furrer and Skinner 2003). Engagement in school is an important academic outcome. It is a good predictor of children's long-term academic achievement and successful completion of school. It also serves as an important indicator of supportive reciprocal relationships and reactions (e.g., students who are engaged are provided with more motivational support by teachers).

Involvement in extracurricular activities reflects students' school engagement. A number of different school-based extracurricular activities are available during high school (e.g., drama club, student council, math club). Research suggests that participation in extracurricular activities increases students' identification with school and school values (Marsh 1992) and is a contributor to educational success (Mahoney, Cairns, and Farmer 2003).

One difficulty with using extracurricular activities as a measure of achievement is that schools vary greatly in resources. Students who attend schools that are financially well supported will have access to greater activities. Consequently, schools that are underfunded often have fewer extracurricular activities for students.

EDUCATIONAL ASPIRATIONS

Educational aspirations are considered an academic outcome. For example, students' desire to attend college is seen as a positive outcome of schooling. An assessment of aptitude, however, can act as a barrier to these aspirations. Scholastic aptitude is most often assessed using the Scholastic Aptitude Test (SAT) to assess students' potential to be successful at college.

Multiple social risk factors (including factors such

as disadvantaged minority status, multiple negative life events, father absence, and maternal anxiety and mental illness) can impact students' academic trajectories (Gutman, Sameroff, and Cole 2003) and outcomes. One factor, socioeconomic status, impacts children's academic outcomes in a profound way. Students who are poor and have low socioeconomic status are more likely to experience academic problems, including a greater likelihood of lower performance on achievement tests, more course failures, more grade retentions, and they are less likely to complete their schooling (McLoyd 1998).

Assessment of academic outcomes may take many forms; however, the most prominent is educational achievement. There has been a nationwide movement toward standards-based education and this has translated into the use of tests and other "high stakes" performance indicators. Assessment of academic outcomes entails obtaining a comprehensive understanding of the unique strengths and limitations of each student learner. In addition, historical, economic, and environmental contexts must be considered in understanding the meaning of the academic outcome being considered.

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ADAPTIVE TESTING

D. J. Weiss (1983) defines adaptive testing as the selection of test items during administration of a particular measure so that the difficulty of items is tailored to the individual. This is in contrast to traditional fixed-item assessments where all examinees are given identical items. Thus, in this format the test is adapted to an examinee's specific ability level during the process of administration by selecting items based on an estimate of the examinee's ability. This procedure ensures to some extent that the majority of the items presented are neither too difficult nor too easy. As noted by Weiss, adaptive tests "mimic automatically" what good evaluators would do in an informal setting. If a question proved to be too difficult for the examinee, the next question posed would be easier. The accuracy of the assessment is based upon the presentation of items

matched to the ability of the person being evaluated. Administering items that are too easy or too difficult tell us little about the potential ability of the individual. Instead, administering items that are closely matched to the level of the examinee provide a more accurate reference point for approximating an examinee's ability.

Alfred Binet, whose interests focused on examining complex mental processes (e.g., reasoning, attention, judgment), developed the first adaptive test. School officials requested that Binet develop a test to differentiate the "genuinely dull." The Binet test was comprised of a variety of tasks involving separate ability functions to obtain an estimate of general intelligence. Binet's measure utilized a variable entry format. The first set of items administered to an examinee was dependent upon their ability level as determined by the test administrator prior to the evaluation. The items that followed were scored on an ongoing basis so that the examiner would select future items based upon past performance. Thus, the administration of the test was adapted to the ability of the individual. A variable termination criterion was employed making the length of the test dependent upon performance. Testing was complete when an individual reached a particular ceiling level (e.g., five consecutive incorrect responses) (Weiss 1983).

According to Weiss's historical review, after Binet's development of the individually administered intelligence scale, adaptive testing as a format remained underutilized. The complexity of creating and administering individually administered adaptive tests made it less popular than simply administering the same items in a group format. Modifications of adaptive testing were explored, such as two-phase tests in which the administration of a second measure was made dependent upon the individual's performance on the first. In addition, the military recognized potential benefits of adaptive testing to select recruits and aid in the placement of personnel. The military supported many research efforts that laid the foundation for the psychometric procedures needed for adaptive testing on a wider scale.

Contemporary adaptive tests utilize similar formats to the early Binet test. For example, the Stanford-Binet Intelligence Scale, Fourth Edition (Thorndike, Hagen, and Sattler 1986), incorporates a routing vocabulary test to provide an estimate of

ability that steers the examinee through this part of the scale. The Stanford-Binet is one of the most popular individually administered tests of intelligence (second only to the Wechsler Scales) used in educational settings. How an individual scores on this subtest, along with the examinee's chronological age, determines to some extent the way in which they begin other subtests on this intelligence measure. There are fifteen other subtests that comprise the Stanford-Binet. Entry levels are arranged hierarchically based upon item pairs. Determinations of a basal and ceiling level are established based upon correct and incorrect responses across these item pairs. That is, a basal is reached when an examinee passes two consecutive levels on a given subtest. A ceiling is reached when the examinee incorrectly responds to three of four items on a particular subtest across two consecutive levels. Once a ceiling level is reached the examiner moves onto the next subtest. Usage of this adaptive testing process lowers overall test administration time as well as potential frustration since the test items are geared more specifically to the ability level of the individual based upon their vocabulary development.

Wide-scale development and administration of adaptive tests began during the early 1970s and 1980s with the increased availability of interactive computers. Usage of technology made item selection and mechanical routing of subtest administration possible in an efficient manner. For more information on Computer Adaptive Testing (CAT) and Computer Based Testing (CBT), refer to the entry on computerized testing included in this chapter.

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INFORMAL (AUTHENTIC) ASSESSMENT

According to Valerie Janesick (2001) authentic assessment is defined as involving a realistic problem or task that requires the examinee to use judgment and innovation in creating a solution. Built into this assessment process are informal opportunities that allow for practice, rehearsal, consultation, feedback,

and refinement of responses as part of the learning experience.

George R. Taylor (2003) links this form of assessment with evaluation, since it can be viewed as a problem-solving process that incorporates multiple methods of collecting information about a particular individual. Informal or authentic assessment addresses some of the limitations noted with respect to standardized tests. Although standardized tests are the most frequently used method of evaluating academic performance, they do not measure all aspects of students' abilities. Informal assessment techniques, when used by teachers in classroom settings, can be a tool by which to assess the strengths and weaknesses of their students. In addition, the use of informal assessment techniques affords teachers more control of the assessment process. The techniques used can evaluate levels of the students' prior knowledge, determine skills that students may have mastered, and monitor their progress. Taylor's review of informal assessment techniques indicates that they can also aid the teacher in providing feedback to the students, facilitate making judgments, and, finally, assist in grading students' progress and achievement in specific curriculum areas. One major benefit of informal procedures is that they can be readily modified for individuals with disabilities. Janesick (2001) identifies a number of examples where authentic assessment procedures are currently used: essays and writing samples, performances, demonstrations, simulations, oral presentations, progress interviews, formal observations, self-assessment, evaluations of case studies, recordings of readings or performances, journal writing, writing folders documenting student's development, role plays and portfolios. The areas to be covered in this entry include: observation, testing, performance assessment, assessment of learning styles, analysis and evaluation of informal assessment data, and use of informal assessment.

OBSERVATION

Taylor (2003) identifies observation as a prime assessment strategy. Teachers engage in observations of their students' behaviors in the classroom on a daily basis; systematizing those observations can assist in the development of informative assessment strategies. Systematic observation can be used to

gather data that can be analyzed in order to understand, correct, or modify a situation or a students' behavior. Observational data can be classified as: narrative, checklist, and rating scales. Specific observational recording techniques include:

1. *Event*: The frequency with which specific behaviors (e.g., tardiness and absences) occur are plotted and analyzed in order to assess patterns. Interventions to change the behaviors can be implemented from analyses of the data. This type of recording can be used for individual students or for groups.

2. *Duration*: Identifies the duration of a specific behavior. A stopwatch is often used with this type of observation to assess the amount of time the student engages in specific activities or behaviors. Calculation of multiple observers' observations results in a process called interobserver agreement, which is expressed as: $\text{Total Cumulative Time} / \text{Larger Observer's Time} / \text{Smaller Observer's Time} \times 100$.

3. *Interval*: Identifies the presence or absence of the specific behavior during a certain period of time. This process incorporates the frequency and duration of a particular behavior. Recording should take place even in the absence of the specific behavior. Reliability of this method of observation can be gained by employing two independent observers. The aforementioned calculation can be used to analyze the data. However, analyses do not have to be precise, and the teacher can also classify behaviors simply as positive or negative.

4. *Time-Sampling*: The number of times a behavior occurs during a specific period of time is counted. With this method, observation time periods are divided into short, equal units. Predictions can then be made about the student's behavior.

Taylor notes, using his own recommendations and those of other researchers, that it is important for teachers to define the purpose of their observations. Prior to choosing and implementing a particular technique, he recommends identifying the following:

1. Where the observation will take place. For example, it may be useful to observe the student in multiple situations.
2. When the observation will take place. For instance, observations can take place at different times during the day.
3. How the observations will be recorded.

Taylor identifies some of the limitations of observation in informal assessment: its focus on process and description, as opposed to content, and limited specificity of the categories related to a particular dimension. For instance, behaviors are observed, but the meaning of those behaviors may not be readily discernable. Moreover, dimensions that are coded may be limited in number, from a minimum of two to a maximum of only six or seven.

TESTING

Testing instruments designed by teachers are also used as part of authentic assessment. Taylor (2003) identifies these as objective-type tests, and states they can be used to supplement or make comparisons with the results of standardized tests. They can also be used in situations in which standardized tests do not adequately capture aspects of content, difficulty, scope, or culturally sensitive material. Taylor recommends that teachers define the purpose of any test to be administered to students, relating features such as order of difficulty, directions for administration, establishment of time limits, item analyses, scoring systems, and the establishment of reliability and validity.

Taylor also recommends using a variety of test items, including true-false test items, multiple choice test items, matching items, completion items, essays, and questionnaires. There are advantages and disadvantages to each type of test item. For example, questionnaires, which consist of a set of questions designed to gather information prior to the administration of a test, may prove challenging to students with disabilities, who may not be able to respond to set questions appropriately. In these instances, teachers can use interviews to elicit information. If a student is not able to provide the teacher with all of the required information, the student's family and/or other professionals who work with the student may also be interviewed. Using interviews can provide teachers with information that will facilitate the development of tests that assess the competencies of students with disabilities. When using interviews, teachers should be aware of the importance of interpreting information received from multiple sources as objectively as possible. Inventories and subject matter tests may also be used to assess the skills of students with disabilities, and can be designed by the teacher or purchased commercially.

PERFORMANCE-BASED ASSESSMENT VERSUS AUTHENTIC ASSESSMENT

Though performance measures have been linked to authentic assessment, Taylor (2003) notes that writers have distinguished performance assessment from authentic assessment. In performance assessment, students complete or demonstrate the same behavior that the assessor wants to measure, with little or no interference involved. In authentic assessment, the student completes the behavior in a real life context that may require, as previously mentioned in Janesick's (2001) definition, development of judgments and innovative methods of problem-solving. Informal assessment, as a form of evaluation that incorporates multiple methods of collecting information about students, embodies both performance and authentic assessment (Taylor 2003).

Performance techniques are preferred by teachers because they do not require either a normative sample or standardization procedures, and also because they tend to be uncomplicated, inexpensive, and non-time consuming. Taylor (2003) notes, using information from his and other researchers' data, some of the common performance assessments that have been used in schools:

1. *Communication Skills*: Demonstrated through writing, speech, and following spoken directions.
2. *Psychomotor Skills*: Involves activities related to laboratory activities (such as dissection), and using implements.
3. *Athletic Activity*: Involves playing with a ball, aerobic movement, and swimming.
4. *Concept Acquisition*: Involves construction of circuits, selecting tools, identifying chemical substances, and making generalizations from experimental data.
5. *Affective Skills*: Involves sharing, working in cooperative groups, obeying classroom/school rules, and maintaining self-control.

Taylor (2003) cites literature indicating that alternative assessments, using informal methods, can be used to gather important information about students who are unable to conform to traditional assessment due to cognitive, social, and physical exceptionalities. These students may be enrolled in course studies that differ from the regular curriculum, and may be work-

ing on life skills curricula that will prepare them for employment, workshops, group homes, and supervised independent living situations. Alternative assessment can incorporate: (1) portfolio assessment, which includes summaries and examples of the students' learning that are checked and updated regularly, (2) ratings scales, (3) checklists, (4) questionnaires, (5) surveys, (6) interviews, and (7) self-report inventories.

Portfolios are the most widely recognized form of authentic assessment. They are used to highlight the progress of an individual's work. In most instances, the learner selects what materials will go into the portfolio to demonstrate improvement over time. For example, students may select papers, book reports, journal entries, photographs, drawings, test results, videotapes, or group projects. There should be some general learning objective that guides what the student selects. The benefits of the portfolio are that it makes use of multiple indicators of progress and provides a historical documentation of the individual's work (Janesick, 2001). The learner is responsible for providing the best representation of their experiences. The portfolio is a dynamic assessment instrument and may be updated over time.

Janesick (2001) identifies three types of portfolios: the working portfolio, the record-keeping portfolio, and the showcase portfolio. The working portfolio reflects the daily work of the student. Teachers, students, and parents may comment on aspects of the work contained in this portfolio. This portfolio enables students to be more self-aware about their own learning process. The record-keeping portfolio can be used to supplement the other portfolios, and generally contains report cards, test scores, and other such documents. The showcase portfolio is the most popular assessment tool in this area. Students select what they believe to be the best examples of their work in a single area or multiple areas. Given the advances in computerized technology, there are also electronic versions of portfolios that can be created.

Students with disabilities may, as previously mentioned, be enrolled in curricula that differ from students who do not have disabilities (Berk 2003). However, the United States' Individuals with Disabilities Education Act mandates that schools place children who require special support or learning in the least restrictive environment that will meet their educational needs. This law led to an increase in what

is known as mainstreaming, which is placement of students with learning difficulties in regular classrooms for part of the school day, or full inclusion of these students into classroom settings. With the advent of mainstreaming, it is important for administrators and teachers to meet the challenges of providing comprehensive informal assessments that meet the needs of all students.

ASSESSMENT OF LEARNING STYLES

Taylor (2003) states that authentic assessment can provide insights into individual learning style preference, which has often been challenging for teachers to evaluate in the past. He delineates three dimensions that teachers must consider when planning instructional programs:

1. *Cognitive*: How students mentally perceive and categorize information and ideas (e.g., some children are abstract learners, others have more concrete learning styles).
2. *Affective*: How aspects of the students' social and emotional personalities affect their learning. This dimension can be affected by inherited traits and environmental conditions.
3. *Psychological*: Involves students' inner strengths, weaknesses, and individual styles. Taylor presents three broad categories of learning styles: auditory, visual, and haptic or kinesthetic.

Taylor indicates that exceptional students develop learning styles using the above dimensions, but may progress at a slower rate. Thus, when evaluating learning styles of exceptional students, it is important to assess:

1. The learning rate of the student. This may or may not be readily observable and may also interfere with the student's ability to learn.
2. The techniques used by the student to organize learning materials. For example, some students organize information in broad categories; others organize information in smaller categories that are developed into broader concepts.
3. The student's need for reinforcement of a need for structure in order to facilitate learning.

4. The student's preferred modality of processing stimuli based on use of the five sensory channels: auditory, tactile, kinesthetic, olfactory, and gustatory.
5. The student's mode of expression of learned information (e.g., verbal and nonverbal).
6. The quality of the student's method of processing learned information.

USE OF INFORMAL ASSESSMENT

Instruction and grading are two methods of using informal assessment data. For instruction planning, teachers should focus on developing evaluating techniques that meet the students' needs. Evaluation of the students' achievement should be based on the measurable and observable objectives of a specific instructional program. Taylor (2003) cites researchers who recommend rubric assessment as a method of identifying evaluation criteria, describing qualitative differences in students' performances, and indicating whether the evaluative criteria can be holistically or analytically applied. Grading can be used to assess students' strengths and weaknesses in content subjects. In instructional planning, grades can be used for administrative purposes, to give students feedback and guidance about their progress and achievement, and to motivate students. Students with disabilities may or may not require modifications of grading procedures. Administrators should develop effective reporting procedures for informing parents of the progress of students with disabilities. Administrators must be familiar with state and local regulations concerning grading practices, and specific types of reporting techniques, including: anecdotal records, work samples, checklists, newsletters, daily/weekly report cards, telephone calls, award systems, using cameras, videotape, and computer technology and, finally, home visits. Communicating assessment data to parents of children who are not disabled would encompass reports on academic performance, social/emotional development, physical development, and classroom behavior (Taylor 2003).

OTHER USES OF INFORMAL (AUTHENTIC) ASSESSMENT

The choice of informal assessment instruments should be appropriate for the student being evalu-

ated. Taylor (2003) recommends that teachers use the following strategies to assist them in choosing and developing appropriate informal assessment instruments:

1. Consider the skill areas to be assessed and identify the informal testing format that will be used.
2. Assess whether or not the content area being evaluated is appropriate to the student.
3. Assess the specific purpose of the informal assessment.
4. Determine what accommodations may be needed.
5. Assess the availability of environmental resources to provide adequate accommodations to students.
6. Evaluate the similarity of informal test content to classroom tasks.
7. Evaluate the relationship of the tests to objectives and mandated standards.

In addition to the types of assessment previously mentioned, Taylor (2003) notes the following approaches: curriculum-based assessment, ecological assessment, task analysis, dynamic assessment, and assessment of learning style. These types of assessment can yield important information about students in context (e.g., cultural, linguistic, and socioeconomic contexts).

ASSESSING STUDENTS WITH DISABILITIES

According to Taylor's research, assessing students with disabilities in educational settings serves four primary purposes:

1. Screening and identification of students who may be experiencing delays or learning problems.
2. Determining the eligibility of a student who is disabled for special education services and diagnosing the student's specific problems and/or disability.
3. Providing program development and placement appropriate to the student's special needs.
4. Evaluating the student's progress.

When developing informal assessment techniques for students with disabilities, teachers must assess the student's level of proficiency in a particular subject. Teachers must also consider the specific disabilities of the students to be tested and assessed (Taylor 2003).

Informal assessment techniques in the classroom can provide teachers with a rich source of information about students' competencies, academic potential, and placement needs. Indeed these same methods may be used to evaluate any learner. For example, portfolio assessment has been used in teacher education programs as well as many work settings. Despite the benefits of using authentic (informal) assessment methods, there have been those who have criticized their use. The politics of assessment have focused on the need to have a standardized score to represent an individual's abilities. Gains are recognized best in terms of score increases. However, proponents of authentic assessment like Janesick note the importance of promoting assessment in a meaningful context and enabling learners to participate in the process. In addition, they note that assessment must be an ongoing process and immediate feedback of the results is critical.

Ellen L. Short

COMPUTERIZED TESTING

There is no question that computer technology has had an immense impact on numerous fields of study. The field of educational assessment is no exception. Technological advances have led to computer-based testing (CBT) and computerized adaptive testing (CAT). Since the advent of computers in the 1970s, there has been a great deal of focus on computerized measurement. This level of interest is similar to the popularity of paper and pencil measures in the 1940s and 1950s. Howard Wainer's (1990) historical review reports that in the 1970s computers were used primarily to score tests and process score reports. In the 1980s the use of computers extended to administration. Currently, computer-based administration, scoring, interpretation, and report-generating programs are available for many of the most popular assessment instruments. The advent of computers has had major implications for the types of measures that could be developed as well as the efficiency with

which they can be administered, scored, and interpreted. It is now much easier to have individualized adaptive systems of item administration.

C. Sue McCullough and Daniel C. Miller (2003) define computerized assessment broadly indicating that all procedures that involve computer assistance in evaluating educational and behavioral goals are part of this area. Under this broad umbrella are standardized measures, questionnaires, interviews, automated test scoring, analysis and interpretation programs, computer-adaptive testing, instructional delivery systems, technology assistance, computer simulations, and electronic portfolios.

As noted by Richard M. Luecht and Brian E. Clauser (2002), computer-based testing represents a major step forward in the assessment process, where "Every keystroke or mouse click, every referencing action, every response, and every elapsed unit of time is a possible source of valid information" (p. 69).

DEVELOPMENT OF COMPUTER-BASED TESTS

The development of CBT parallels the process described in the test development section of this chapter. For example, large numbers of items must be generated based upon knowledge of the identified construct to be tested. These items are then evaluated based upon "program requirements for levels of content, difficulty, and fairness" (Parshall 2002, 119). Items that appear to perform well are incorporated into the test bank contained in the test program. Item statistics such as difficulty, discrimination, and distractor performance are taken into consideration.

Computer-based tests are also able to quantify more succinctly the speed at which examinees respond to items. On traditional paper and pencil, test speededness was based upon how many items remained unanswered at the end of the examination period. With CBT, response times can be generated for each item and can provide an overall average item response time. It is important to note, however, that speededness may be impacted by language, familiarity with computers, and cultural perception (Schnipke and Scrams 2002).

COMPUTER-ADAPTED TESTING

A major application of computerized testing is in the creation of adaptive testing. Large numbers of items

can be stored in a computer database and for a particular given area; the computer can select and administer items tailored to the abilities of the individual taking the test. The computer program determines what subsequent questions should be asked of particular individuals taking the test based upon the ways in which they answer previous items. For example, a student who answers basic math questions (i.e., addition, subtraction) incorrectly would not be administered higher-level questions involving complex calculus. A major benefit of adaptive testing is that tests can be tailored to specific response patterns, therefore, examinees will most likely be more motivated and testing time will be shorter.

McCullough and Miller (2003) note that item response theory (IRT or “latent trait theory”) is the foundation of computer-adapted testing. As discussed in the test theory entry of this chapter, IRT relies upon the item characteristic curve that identifies the probability of a correct response to a particular test item as a function of the examinee’s ability in that particular domain.

INSTRUCTIONAL DELIVERY SYSTEMS

Another application of computerized testing is focused on instructional delivery systems (McCullough and Miller 2003). These include: computer-based instruction, information-processing tools, and concept mapping. Computer-based instruction works in a parallel fashion to computer adaptive testing. The computer stores information with respect to an individual’s level of mastery of a particular instructional program. Instruction regarding a particular concept may be broken down into subunits or expanded, based upon the examinees’ test performance on particular units. The computer can track and summarize each student’s progress. Benefits of computerized instruction programs are that students can move through material at their own pace and immediate feedback is provided, which can increase student motivation and eventual mastery of material.

COMPUTERIZED ADMINISTRATION AND ANALYSIS

Many tests are administered and analyzed through the use of computers. Given the capacity of comput-

ers to perform statistical operations automatically, one strength of computerized testing is the amount of information that is generated based upon item responses. For example, factors scores, standard scores, standard deviations, and stanines are often generated automatically. Most major tests in existence currently provide some form of computerized assistance in terms of scoring. Even projective measures (e.g., the Rorschach Inkblot Test) that do not generate scores per se provide scoring programs to assist the examiner in interpretation. It should be noted that in some cases the examiner must still record responses and score items given the individualized nature of the measure (e.g., individual intelligence tests). While automated scoring methods are common with respect to multiple-choice tests, computerized scoring has the potential to ease the evaluation process for performance-based measures that require a degree of human judgment. Scoring systems may be devised to reduce the number of raters/ graders needed to evaluate a performance-based measure, thereby making it more cost effective (Dodd and Fitzpatrick 2002).

In addition to test scoring (e.g., storing information pertaining to correct and incorrect responses), the computer also provides a calculation of raw scores and standard scores and compares scores to test norms provided by the publisher. The computer is also able to generate information such as percentiles, stanines, normal curve equivalents, grade equivalents, IRT scoring patterns, and factor scores. On some achievement tests (e.g., the Woodcock-Johnson Achievement Battery-Third Edition) the information provided is based on age norms and/or grade norms. Additional information provided by certain measures may include achievement-aptitude discrepancy formulas to help determine whether an individual may have a processing disability.

COMPUTERIZED INTERPRETATION

Some test developers also provide computerized interpretation programs. These programs contain decision rules that take into consideration particular variables deemed important by the test developer (e.g., age). The program also contains criterion rules that lead to interpretive statements and a computer generated report. The computer stores a database of

qualitative statements that are attached to particular scores or score configurations.

McCullough and Miller (2003) note that computerized interpretation programs have been challenged in the following areas: (1) comparison with trained examiners, (2) legal and ethical issues, (3) validity of computer-generated interpretive reports, and (4) examiners over reliance on the computerized report rather than clinical judgment. More information regarding these concerns is provided in the discussion of computer-based testing limitations below.

The benefits of computerized interpretation are numerous. To begin with, the examiner saves valuable time. There is potentially greater accuracy in scoring although errors in data entry can occur. In addition, interpretations may be less biased since the computer will not be influenced by examiner biases that impact the accuracy of the assessment (e.g., stereotypes about a particular race or ethnic group, negative referral information, or socioeconomic status). However, it should be noted that bias may still be present if the administration or scoring of the test was systematically flawed. In addition, the computer can search through a vast number of potential interpretive possibilities in a systematic manner that exceeds the capabilities of an examiner. It should be noted that computerized interpretation programs may also be adjusted to include cautionary statements that the examiner can take into consideration when making judgments about the results obtained. One example may be in terms of application of the test to members of marginalized or oppressed racial/ethnic groups or linguistic minority groups (e.g., English as a Second Language). In addition, the programs often integrate current research and may note different scoring patterns for particular groups that should be considered in the final interpretation. The computer may also “red flag” potential areas of concern that the examiner can consider when completing an evaluation report.

INTERACTIVE COMPUTER SYSTEMS

Anne Anastasi (1997) reported the growing complexity of computer applications in testing based on interactive computer systems. These systems enable the examinee to have direct engagement with the computer system using response stations. For

example, multimedia and computer interactive technologies enable the presentation of realistic situations while allowing for various response options by examinees. She noted that such formats have been used in education and career decision-making assessment practices. In these instances the computer stores information about the individual along with data regarding educational programs and occupations. The computer then matches the individual with different occupational and/or educational databases.

CONCERNS REGARDING COMPUTER APPLICATIONS IN TESTING

Major professional organizations have developed ethical guidelines addressing usage of computers in testing. The testing standards endorsed by the American Educational Research Association, American Psychological Association, and National Committee on Measurement and Evaluation includes discussion of appropriate computer test applications.

Anne Anastasi (1997) noted literature indicating two major concerns: computerized testing in terms of score comparability and narrative interpretive scoring. With respect to the former, given that the same test may be administered in a paper and pencil format as well as in a computerized format, the comparability of scores needs to be addressed. These two testing formats need to be equivalent (e.g., an examinee would demonstrate the same level of ability in either format) in order for the norms to be applied appropriately. In addition, questions regarding reliability and validity may also arise given that these psychometric concepts are usually addressed based upon one format or the other. Examinee experience with computers may also contribute to test performance. Therefore, groups with greater access to technological resources may score higher than those without much computer exposure.

Questions have also been raised with respect to the issue of interpretive reports. Computer packages must integrate information regarding the validity, reliability, and other technical features of the tests. Interpretive statements are generally derived based upon programmed cut-off scores and these must be theoretically and empirically supported. Some computer programs are based upon judgments and anecdotal information regarding the decision-

making process of experts in the field. An example of these application programs may be seen in computer software designed for clinicians making diagnostic decisions. It must be made clear to the consumer how these experts were identified and used in the development of the program. In addition, computer-generated interpretation reports should be used in combination with clinical judgment. The computer takes into consideration only contextual variables for which it was programmed; therefore, it cannot replace the clinical skills of a competent practitioner.

FUTURE POSSIBILITIES FOR COMPUTER-BASED TESTING

The potential of computer-based testing remains to be seen. The possibilities appear endless as researchers such as Anastasi (1997) note that many of the current limitations may be overcome in the near future. In addition, the computer may be able to accommodate and integrate vast arrays of knowledge regarding an individual examinee—behavioral observations, historical information, and so on. McCullough and Miller (2003) report areas that will characterize future trends in computerized assessment: The Internet will play a bigger role in the administration and scoring of computerized tests and scoring materials. Examiners may be able to download measures as well as scoring information directly from the Internet. Increasing technological sophistication will enable the measurement of not only particular test outcomes but also the process of decisionmaking and problem solving. Integration of other sources of information—quantitative as well as qualitative—will be more readily available.

Lisa A. Suzuki and John Kugler

CRITERION-REFERENCED TESTING

Educators use tests for a variety of purposes, including determining proper placements of students, planning appropriate programs of instruction for them, and evaluating the effectiveness of educational interventions. In making these decisions, teachers and administrators are often concerned

with the actual academic competencies a person has attained. Criterion-referenced tests (CRTs) are “designed expressly for interpreting an individual’s performance in terms of what he or she can and cannot do irrespective of the performance of other students” (Berk 1984). These types of tests may be referred to by a number of titles, including “criterion-referenced,” “competency tests,” “mastery tests,” and “standards-based tests” (Hambleton and Zenisky 2003).

Since the 1960s there has been growing interest in the type of information that can be obtained from CRTs of educational competencies (Nitko 1984). In more recent years the standards-based movement has prompted test publishers to develop an increasing number of measures that assess an individual’s competencies, rather than focusing primarily on a student’s standing when compared to a normative group (see norm-referenced testing entry).

In fact, CRTs were developed to specifically address some of the shortcomings of the norm-referenced tests (NRTs), particularly in the area of instructional planning. CRTs are meant to provide more detailed and specific information about what specific skills a student possesses and what skills they need to learn next. Since CRTs are measures used to assess levels of competency or proficiency in given areas of ability, they can provide more information on what exactly the examinee knows and what they don’t know. With respect to academic achievement, this can include various skills of reading, mathematics, writing, as well as content area knowledge or application and higher cognitive processes.

Ronald Hambleton and April Zanisky (2003) cite several key issues related to understanding the purpose of CRTs, their development, proper use, and interpretation. Among these issues are: (1) understanding the difference between criterion-referenced and norm-referenced tests, (2) reviewing methodological issues of validity and reliability, and (3) determining how scores from CRTs are provided (e.g., in reports) and used appropriately by the consumer of these measures.

While NRTs are discussed in greater detail in a separate entry within this chapter, one essential difference will be highlighted here. A significant difference between NRTs and CRTs is the purpose of each type of test. NRTs are primarily developed and used

to place individuals along a normal curve in comparison with others in a sample population. In general, a NRT is designed to achieve a range of scores in order to maximize the separation of individuals along a continuum of some ability. How well each person does in the normative sample will affect the standing of others in the standardization group. The question asked by a NRT is, where does this person place as compared to his or her peers, usually on broad measures of some ability or abilities. CRTs, in contrast, are designed to assess a person's competence in a more specific content area. In addition, how well others do on the CRT will not change the interpretation of that person's performance on it. The score achieved on the CRT reflects the individual's level of competence in some domain and is unaffected by the performance of others. The information sought on a CRT concerns a person's level of performance in some specific content domain.

TECHNICAL ISSUES RELATED TO CRITERION-REFERENCED TESTS

There is overlap with respect to the process of development of NRTs and CRTs; These include the importance of standardization of administration instructions and scoring criteria and the effects of test length on reliability, among others. These issues are discussed more fully in the chapter entry on test development. At the same time, technical differences do exist. The following discussion will examine issues of test format, item type, reliability, and validity as they relate to CRTs.

Test Format

A. J. Nitko (1984) notes that there are numerous types of CRTs that have been developed. The format of the test is based in part on the purpose of the test (e.g., has mastery been attained; what skills have been acquired) and the demands of the content domain (e.g., mathematics; copying alphabetic letters) from which items are drawn. This discussion of the variety of types of CRTs that could be developed will not be exhaustive, but will highlight some of the most common formats.

One type of CRT can be developed to determine a person's skill in responding to material at various levels of subject difficulty. The information sought is the

person's functional level with respect to the highest point or level of item difficulty they can achieve. For example, a reading test might be developed with passages of increasing difficulty. The score might be the highest point at which a person can successfully read and respond to various comprehension questions. The results could then be used to determine the appropriate instructional level of reading text for that individual.

A second type of CRT might be used to measure a person's level of proficiency in an area such as psychomotor ability. On these tests, the scores are on a continuum that starts at a beginner's level and goes up to the level of master. The tasks on the test are designed so that more proficient individuals are able to complete a task more efficiently due to greater speed (e.g., more quickly completing certain steps in the task), or changes in how they complete the task (e.g., skipping certain steps that were necessary at earlier stages of learning) or needing less attempts in completing the test (e.g., one pass through the task versus several tries to complete the task). Scores on this type of task measure the increasing ability of the person to perform the task more accurately and efficiently. An example might be tying one's shoes. Children who have become proficient at it can engage in the motor routine quicker, may not need to talk themselves through it (skipping self-verbalizations) and be able to do it well in one attempt. A child just learning the skill would need more time, might need to verbalize/sub-vocalize directions and might need several tries to complete the task.

Another type of CRT assesses skills or content domain involving a fairly consistent hierarchy of skills. That is, the items fall on a continuum on which competency on item A must be achieved before you can succeed on item B. The information obtained by this task indicates that person's current position in the sequence of learning that task. The results can also indicate what they need to learn next. A CRT that assesses a child's performance on a developmental domain would be an example of this type of measure. For example, most children need to walk before they can hop or will learn to speak in short "telegraphic" phrases before uttering complete sentences. Measures of readiness skills for kindergarten might also be constructed using this format.

In constructing CRTs, early test developers reviewed the content domains of the skills being evaluated. They then attempted to define these domains by writing

clear behavioral objectives. The thinking was that such objectives would provide a clear picture of the skills to be assessed. These objectives would then provide the template for the items to be included in the instrument. However, these initial endeavors proved difficult because the objectives led to measures that were not written in a manner specific enough to help plan instruction or even provide accurate score interpretation. Since this was the main goal of these measures, these efforts eventually fell out of favor.

More recently, “the trend in CRT practices has been to write objectives focused on the more important educational outcomes” (Hambleton and Zenisky 2003, 380). This has led to the development of objectives that take into account the curriculum standards of a particular school, district, or state. As part of this development, more effort is put into generating a variety of item types that might be used to assess a particular outcome. Measures created in this manner are more specific in their intent and are therefore more useful for a particular purpose, such as assessing how well someone has met the fifth grade mathematics standards set by a certain school district.

Item Development

In order for a CRT to be useful and accurate, the items on the measure must be drawn from a very narrow and well-defined domain. The more specific the group of items, then the more precise will be the interpretations of scores on the test. As a general rule, the test items have to sample areas of the specified domain to provide sufficient confidence that the person is in fact proficient.

Once the content area has been clearly delineated, test developers explore ways of assessing that domain. In developing a new measure, test developers generally have two options. One option is to identify and use an existing bank of items appropriate for assessing the area of interest. These items may be modified based on the type of item to be used. The other choice is to build a new item bank from which to draw material for their measure. The new item bank is often developed by a team of people, including experts in that particular area as well as educators who are teaching in that content area. Their work involves matching the goal of the assessment to a particular item type. Hambleton and Zenisky (2003) list seven different types of items that might be used

on CRTs: multiple choice, selection/identification, reordering/rearranging, substitution/correction, completion, construction, and presentation. They suggest that these seven types might be divided into two groups, with the first four response types seen as “selected” items because information is available in the test (e.g., multiple-choice responses) for the examinee to choose. Responses to these item types may include some degree of both guessing and cued recall based on what is provided on the measure. Although primarily used in the past to tap more basic skills and abilities, they can also be written to tap certain higher cognitive processes. The latter three item types are viewed as “constructed-response” items because the examinees must, to a greater degree, generate information from their own knowledge base with limited information that might provide cues to the answer.

In the development of a criterion-referenced test, efforts may also be made to create a test that can be compared with similar measures already in use at different levels (e.g., grade or age) over time for the same individual. As Hambleton and Zenisky (2003) point out, efforts are being made to statistically equate a number of the licensing tests and other state mandated exams. This is being done in part to allow those administering the tests to measure growth or change in students or individuals over time and from one measure to the new one.

Test developers may also make use of “anchor” test items. That is, several items from the original measure of a known difficulty level are readministered along with the new items on subsequent tests to determine changes over time/development and how well equated the second measure is with the first. They note that a sample size of approximately one thousand examinees and a pool of about ten to fifteen items are often adequate for equating the forms. However, samples of greater size coupled with a larger number of anchor items could increase the confidence in the equivalence of the forms (Hambleton and Zenisky 2003).

Reliability

In determining the reliability of a CRT, test developers may utilize various methods. The main issue is the consistency of group placement (e.g., beginner, advanced) by a given measure. Unlike many NRTs, cer-

tain reliability methodologies may not be as readily available to developers of CRTs. There are often difficulties inherent in trying to develop a parallel form of the test such as the time and expense involved in creating such a measure, particularly one that may not be given on a national level. In addition, test-retest methods may be impacted adversely by the examinee's continued participation in a learning situation that is intended to increase scores for the individuals taking the test. One method currently used to establish reliability (split-half) involves taking a sample of half the items and using them to determine a person's placement in one of several groups (e.g., novice, proficient, advanced). Then the second half of items from the same test is used to reclassify the individuals into groups. The level of agreement between the two classification tables is used as a measure of internal reliability. The aim is to have people consistently placed in the same category (e.g., proficient) both times from the items obtained in this one assessment.

Content Validity

Assessing a measure's content validity is important for both CRTs and NRTs. However, the main purpose of a CRT is to specify a particular domain of content and assess it based on a particular classification paradigm. One difference is that the NRT tends to utilize items drawn from a broader sample of content as compared to the more narrow range of items found on a CRT. Due to the fact that content drives the development of a CRT, it is clear that attaining appropriate content validity is crucial to the success of the measure. Experts in the area from which the items are drawn (e.g., physics) often serve as judges to determine the content validity of a CRT. In addition, individuals from a particular group (e.g., teachers) with knowledge of the particular course of instruction or standards are also often consulted to help determine if the measure has adequate content validity. As with a NRT, items that do not appear relevant or might be confusing with respect to wording or possible responses are eliminated or revised in the course of a content validity review.

Criterion and Predictive Validity

The outcomes of the limited sampling of tasks are meant to provide an accurate measure of the person's

proficiency that can be interpreted to predict the broader area being assessed. In many cases, this involves assigning individuals to a particular level of proficiency based on their performance on the CRT. That classification result is then compared to the classification derived from another source (e.g., teacher ratings of a student's skills). The closer the match between the two tables, the more the test is considered a valid measure of that ability or skill. If the agreement between the measure and other assessments of that person's classification is low (and hence the validity is low) test developers may wish to examine how the external sources arrived at their judgments. They may also explore the item type to determine if it is measuring the skill in a manner similar to how the external sources might evaluate it. For example, if the external sources use completion-type items to assess their student's skills and the CRT used a multiple-choice format, this could conceivably lead to different results in classifying levels of proficiency.

Scoring and Interpretation Issues

A well-developed CRT has the advantage of results that are readily interpretable in terms of specific performance standards. Since it is intended to sample a more limited area of ability, it can provide better generalizations of a person's skill or ability than a NRT. For example, a NRT may tell you that a student is average for his grade in mathematics when compared to his peers. However, it does not readily inform about his computational abilities. However, CRTs that assess basic math skills that have been clearly defined can allow for stronger generalizations regarding a person's performance in a defined area of mathematics. They may also provide information on how close a person is to attaining a certain level of proficiency. In addition, results may also be used to determine how much progress an individual has made and/or the benefit, in terms of skill gains, of an educational program (e.g., an intervention in reading or a new mathematics course). CRTs may also be more sensitive to changes in abilities than many NRTs. This might allow better assessments of both a person's progress with a certain educational approach or intervention as well as the effectiveness of a particular program for a group.

John Kugler

EVALUATION

Evaluation in educational settings takes place at a variety of levels, both individual and programmatic. At the individual level, educational measures are used to identify particular characteristics about students and teachers. At the programmatic level, evaluation methods are used to examine outcomes, for example effectiveness of interventions. Given that other portions of this chapter address teacher assessment and the usage of various forms of measurement with students, the focus of this entry will be on the process of evaluation. In particular, the usage of multidisciplinary assessment practices in determining special education and gifted placements as well as program evaluation will be addressed. A central focus will be on evaluation of students with special needs given the important roles tests have played in determining educational classifications, placements, and services.

EVALUATION OF STUDENTS WITH SPECIAL NEEDS

The process of evaluation in this area begins with the identification of students who are having behavioral and/or academic difficulties in school. Parents, teachers, or other school personnel (e.g., administrators, counselors) are often the first to identify potential problems and concerns. This may be based upon personal observations or performance based on academic measures.

The next step in the process involves engaging in prereferral interventions, for example: further investigation of academic records, more intensive observations, family meetings, engagement in at-risk or prevention services, and teacher-based classroom observation. Determination of appropriate prereferral interventions often involves a multidisciplinary team. If at this stage, the team considers the problems to have been alleviated, no further evaluation is supported. However, if concerns continue to be noted then the team may determine that a more intensive evaluation is needed. This involves a multidisciplinary assessment involving different types of evaluation including: intelligence, achievement, psychological/emotional, and language. These involve a team of professionals with expertise in a variety of areas (e.g., a school psychologist, edu-

cational evaluator, school social worker). The types of evaluation tools include observation, teacher interviews, student interviews, dynamic assessment, standardized assessment, neuropsychological assessment, medical assessment, personality assessment, and adaptive behavior assessment.

Observation

Observation of a child in the educational environment can provide valuable information regarding how the child functions on a daily basis and can offer important clues as to why they are failing. As such, it can contribute to a clearer understanding of the source of the child's failure. This might include aspects of the classroom environment that impact learning (e.g., where the child sits, any distractions in the class such as noise, the class size, organization of the class, time of day when the class occurs—whether the child is fatigued late in the day, for example, or high energy after lunch). Observations can also note the child's on-task behaviors, attention, and quality and types of interactions with the teacher and students.

Teacher Interviews

An interview with a child's teacher can provide valuable information about a student's functioning. The teachers' perception of the child's functioning might include not only how she is doing, but also information on the teacher's attempts to help the student, potential reasons for failure, comparison of that student with her peers, and what competencies the student appears to possess and what is lacking. In literature on consultation models, it has sometimes been noted that when teachers are able to clearly identify the academic problem they are then more readily able to generate some possible solutions or interventions. This can allow them to better understand what is happening with that individual and intervene more effectively with, or sometimes without, further evaluation.

Student Interviews

It is often helpful to speak to the individual experiencing the educational problem to obtain his perspective on it. Although it can be helpful at all ages, it potentially becomes increasingly useful at the higher grades (i.e., upper middle school and beyond). The

information they provide should help in determining what other measures, if any, will need to be administered. Issues addressed in the interview can include but are not limited to, attitudes toward education in general, feelings about specific subjects, motivation to succeed, self-efficacy, the quality and quantity of support in the individual's environment, the knowledge of and use of various study skills, organizational skills, personality factors (e.g., depression), and future goals and plans. This information can be collected through informal conversation or structured interviews, checklists, and/or rating scales, to name a few.

Dynamic Assessment

Many traditional norm-based assessment models tend to focus on collecting data that is primarily static in nature. In such a situation, a student provides answers to a series of questions. His or her score is marked as correct or incorrect and is seen as a measure of what they have learned. From this measure it is assumed that future performance can be predicted in terms of what he or she could learn. However, some test developers have created measures aimed at actually assessing a person's learning potential. To address questions of process, a method called dynamic assessment was developed (Feuerstein 1979). In this model, students' skills in some area are assessed. They are then taught in that area and then reassessed to determine their response to teaching. This method can provide an important piece to the evaluation process, revealing what type of instruction works best and how well they do with new learning. More recent assessment models have also introduced a concept focused on a person's response to treatment protocols. In this model, a person's response to an intervention provides information as to the type of learning problem that is experienced. A child who responds very well to educational intervention may not be viewed as being impaired compared to a peer who does not respond as well to the same treatment. The former student's academic problems might be viewed as due more to educational opportunity while the latter may have some form of learning disability.

Standardized Assessments

Standardized assessment instruments are used to provide information regarding an individual's standing

relative to a group. Measures of intelligence as well as academic achievement are included in this group. Discrepancies between measures of aptitude and achievement were traditionally used to determine classification of learning disabilities. However, there has been a recent trend toward identifying the presence of any processing deficits that may impact learning (for example, phonological processing problems or visual-spatial). Knowing more about a student's processing abilities may prove more useful and relevant with respect to planning educational interventions.

Neuropsychological Assessment

The 1990s was designated the "Decade of the Brain." Neuropsychological measures look at brain-behavior relationships and can provide useful information for educational decisionmaking. In particular, students who have experienced some form of traumatic brain injury benefit from an assessment of their neuropsychological strengths and needs. Information from such an evaluation can inform individualized educational program development to address areas such as memory difficulties, issues of attention, and concentration, language processing problems, and/or weaknesses in fine and gross motor skills. There are a number of measures currently in use, including batteries such as the NEPSY: A Developmental Neuropsychological Assessment, the Halstead-Reitan Neuropsychological Battery for Older Children, the Luria-Nebraska Neuropsychological Battery-Children's Revision, and/or more specific tests such as the Rey's Complex Figure Test or the Wisconsin Card Sorting Test. In addition to assessing students with traumatic brain injury, neuropsychological measures can also be used with students with other learning disorders to better understand their needs. Students with dyslexia, Asperger's Syndrome, autism, and attention deficit disorder may all have significant cognitive processing concerns that can be identified by tests of this type. As with students who have experienced a traumatic brain injury, information from these measures can lead to better academic program development for these students.

Medical Assessment

In the early stages of assessing students experiencing academic problems, educators and clinicians attempt

to rule out problems in basic sensory areas (i.e., visual and hearing). Research has shown that children who experience otitis media can have intermittent hearing loss. This can effect language development and the acquisition of good auditory processing skills. Other medical issues to be explored include students' ability to control their behavior, attend to lessons and to maintain an appropriate level of alertness during the school day. These abilities can be impacted by a number of factors, including medical conditions (e.g., disorders of the central nervous system) and psychological ones (e.g., depression).

Personality Assessment

Personality assessment may be conducted if there are questions concerning the impact of mental health issues on academic performance (e.g., depression, attention deficit disorder). It may also determine if there are effects from mental health issues resulting from academic difficulties (e.g., poor self-esteem, learned helplessness). Personality assessment can provide important information in addressing all facets of the student's difficulties. Examples of some measures used for this assessment include rating scales, interviews, and projective tests.

Adaptive Behavior Assessment

Educators have long recognized that some students may struggle academically and yet still are able to function in the environment outside of school. Adaptive behavior assessments serve several purposes. They have been used to differentiate specific academic delays from more global limited cognitive functioning. They have also been used to assess important areas that may not be deemed academic, but which impact overall school functioning. These include social skills and independent living skills. Educators who work with students with special needs, particularly developmental disorders (e.g., mental retardation, autism) or significant emotional problems, may benefit from the information such scales provide. Examples of these types of tests include the Vineland Adaptive Behavior Scale and the American Association on Mental Retardation (AAMR) Adaptive Behavior Scale. Both scales collect information in an interview format with individuals familiar with the person being assessed (e.g., caregiver, teacher).

Based upon all of the data gathered, a determination is made as to whether or not the student is eligible for special services (e.g., special education). If the evaluation team determines that the individual does not meet the criteria of a handicapping condition, then no further services are provided and the student will remain in the regular education setting. If the results of the evaluation indicate that the student meets the criteria for a particular educational classification (i.e., special education) then steps will be taken to provide the most appropriate placement and this decision would involve input from school personnel, family members, and student advocates. Educational services are provided based on the type and severity of the individual's needs. There is a continuum of services offered by each school district. Services may range from the child staying in his or her class and the classroom teacher working with another teacher trained to provide special education to a more restrictive option where the child is pulled out of the classroom to receive additional help one or more times a day. Further down the continuum, a child might be placed in a self-contained classroom out of the mainstream of regular education services. Children placed in special classes may be given opportunities for participation in mainstream classes for content area academics (e.g., mathematics) and/or nonacademic areas (e.g., physical education). In some circumstances, individuals are placed in more restrictive settings such as special programs in separate schools or programs run in hospital settings (e.g., psychiatric programs).

EVALUATION OF GIFTED STUDENTS

Giftedness has generally been determined based upon multiple evaluation criteria. These include: scores on standardized intelligence/achievement tests, nominations by teachers, parents, peers, and the students themselves, academic grades, portfolios, and information obtained through inventories and checklists addressing characteristics associated with giftedness. Different cut-off scores, rating instruments, and nomination procedures may be used in various school districts. In addition, there are often differences in weighting placed upon areas of the evaluation depending upon school policies. Despite the multidimensional factors contained in this evaluation process, concerns have arisen regard-

ing the evaluation procedures involved in identifying gifted students. In particular, examination of numbers of racial/ethnic minority students tends to be disproportionately low relative to the overall representation in the school age population. Overreliance on standardized aptitude tests in the determination of giftedness has been identified as contributing to this discrepancy given the racial/ethnic hierarchy noted on various intelligence and achievement tests. For example, black and Hispanic students tend to score lower than whites on most standardized measures of ability.

PROGRAM EVALUATION

There are a number of program evaluation methods that can be employed in educational settings to address a variety of purposes. The general goals of a program evaluation include: (1) to determine how resources should be allocated to meet educational goals, (2) to verify implementation of planned programs, (3) to examine outcome data with respect to program goals, (4) to provide comparison of outcomes based upon different intervention programs, (5) to determine which programs provide the most-needed services, (6) to obtain information to maintain and improve quality of services, and (7) to monitor for unplanned potential outcomes (Posavac and Carey 1997). In particular, the major evaluation methods often cited are needs assessment, process evaluation, outcome assessment, and efficiency examination. Attention needs to be given to whether the program was developed to address short-term needs, long-term needs, and/or potential needs of a particular population (e.g., at-risk students). Evaluation data may be obtained through examination of records or preexisting documents (e.g., student records), test measures (standardized or informal assessment tools), or qualitative methods (e.g., interviews).

Program evaluations often involve multiple sources of information from interested parties or stakeholders. Initially, a needs assessment may be performed to determine what areas of intervention are deemed necessary. Based on this information programs may be selected or developed along with determining methods of evaluating program effectiveness. These methods may include formative evaluation in which results are used during the intervention to obtain

feedback. This information may be used to modify current intervention practices or redirect resources. This differs from summative evaluations where methods are used to determine the overall effectiveness of a particular program and to make final judgments (e.g., post testing, exit interviews).

The process of evaluation takes many forms in educational settings. The various measures and methods used span a variety of disciplines and involve many educational stakeholders. It is important to think of evaluation techniques and methods as having an impact not only at the individual level but also the programmatic level.

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HIGH STAKES TESTING

Public scrutiny and debate about high standards in education and accountability have led to the creation of high stakes testing in the United States. High stakes testing is defined as the usage of measures whose results have serious consequences for the test taker or other stakeholder (e.g., administrators, school district personnel). Results of these measures may be used to determine whether a student is promoted to the next grade or whether they graduate. Additionally, test scores are used to judge the quality of a particular school or district and may be used in funding decisions and determination of leadership (i.e., principal positions) at particular schools.

Advocates of high stakes assessment indicate that these measures provide indicators of student achievement, school quality, and an index to be used for accountability in the educational system (Jones, Jones, and Hargrove 2003). However, attention must be paid to schools that have been neglected in the past. Documentation of test scores by schools and districts in newspapers and on websites has brought public attention to underserved populations and schools that are failing. In addition, high stakes tests are often in a multiple-choice format and therefore are viewed as economical because they can be administered in a relatively short period of time to large groups of students. High stakes tests may be computer scored thus allowing statistical information to be readily obtained with

respect to an individual student's performance in comparison to local, regional, and national norms.

Concerns regarding high stakes assessment practices are numerous (Janesick 2001; Helms 1992, 2002). Following are some of the problem areas that have been associated with these practices:

- construction of tests
- scoring and interpretation of tests
- penalties of the tests if test takers are below par
- issues of fairness
- teachers teaching to the test
- cultural equivalence

In addition, critics note that movement toward high stakes testing has led to a focus on scores obtained on standardized tests rather than on the process of assessment. This may be problematic for particular students given the limitations of the measures themselves as well as scoring patterns (i.e., higher failure rates) for students from marginalized and oppressed groups in the United States (e.g., African American and Hispanic). Some minority groups have historically been denied access to educational resources. A disproportionately high number of low-performing schools tend to be in minority communities with low socioeconomic status (Johnson and Johnson 2002; Jones, Jones, and Hargrove 2003). The impact of high stakes testing in these communities may be detrimental given that it may result in a primary focus on only the academic basics—reading, writing, arithmetic—and the absence of a diverse, enriched curriculum.

HISTORICAL CONTEXT OF HIGH STAKES TESTING

The quality of public education and student achievement has been the focus of politicians and educators for decades. In October 4, 1957, the former Soviet Union launched Sputnik, creating an impetus for the American public to scrutinize and demand higher standards with respect to the science and math curriculum in American schools. Over twenty years ago the report "A Nation at Risk: The Imperative for Educational Reform" (National Commission on Excellence in Education 1983) was published, again leading to a focus on what was viewed as substandard curricula and low achievement in American

schools. Events such as these led the public to demand changes in the educational system and greater accountability for student achievement. One outcome of this was the determination that test scores represented valid measures of achievement. As noted in the historical review by M. G. Jones, B. D. Jones, and T. Y. Hargrove (2003), by 1991 school reform efforts were identified within the purview and domain of state governance. By 2000, all states but Iowa had implemented statewide testing programs. Forty-one states included multiple-choice exams as part of the assessment process. In 2002, the No Child Left Behind Act further solidified testing as a mainstay of evaluation of quality in educational practice. This law requires that students in the third through eighth grade be tested in the areas of mathematics, reading or language arts, and science. In effect, it raises the stakes with respect to test outcomes for both the individual student and the schools or districts in which tests are administered.

IMPACT OF HIGH STAKES TESTING ON EDUCATION

Jones, Jones, and Hargrove (2003) note that high stakes tests have led to comparisons of teachers, schools, and school districts. A number of rewards are tied to the results of these tests including determination of teacher merit (i.e., salary bonuses), media recognition, continued employment for school administrators, and greater freedom of curriculum decisions.

High stakes testing has an impact on all levels of educational practice from the curriculum to the role of teachers in the classroom. Current educational theories note the importance of student-centered curriculum. This perspective supports activities such as cooperative learning, student discussion, and personal discovery in education, with the teacher viewed as a facilitator or guide. There has been some criticism of the student-centered approach, however, by some educators who feel it does not stress the basic academic skills that are so often emphasized in high stakes testing programs. Teacher-centered methods that focus on lecture and direct instruction appear to be more congruent with the high stakes testing movement. A balance between both methods appears to be the most effective form of instruction given that student-centered instruction promotes critical thinking skills and creative problem solving, while

teacher-centered practice is effective in communicating domain-specific knowledge. High stakes testing often emphasizes domain-specific knowledge to the exclusion of creative problem solving and higher order decisionmaking skills. It should be noted that these skills are difficult to assess with any standardized measure given current formats that depend upon one correct response.

Concerns have been raised with respect to educational instruction being primarily focused on the information covered by the tests, i.e., teachers teaching the test. In addition, anecdotal evidence suggests that the pressure on teachers, administrators, and students to obtain high scores on these measures has led to cheating and unethical behavior. For example, a school with large numbers of immigrant students (for whom English is a second language) may opt not to have these scores included in the overall summative report. Teachers may focus their energy on test preparation skills rather than their planned curriculum. It is well documented that test strategies can enhance performance on multiple-choice tests. Indeed a number of companies offer courses that guarantee test score gains. Unfortunately, these services are often available only to privileged groups within the educational system (e.g., some private schools offer test preparation programs as part of the curriculum). More egregious acts have been noted, such as school personnel changing responses to items. Computerized scoring programs have been designed to detect numbers of erasures on response forms to address this potential problem. Despite the added pressure of external demands many teachers report that their schools tend to engage in symbolic responses without any substantive change in teaching methods or other approaches that would foster student development (Firestone and Mayrowetz 2000).

The high stakes environment also has an impact on school climate and student motivation. For example, research indicates that high stakes tests may lower the intrinsic motivation of students to achieve in school. In addition, students may experience higher levels of stress and anxiety that also negatively impact motivation.

Finally, high stakes tests as currently implemented are often associated with lower retention and higher dropout rates for students who score low on these measures.

TYPES OF HIGH STAKES ASSESSMENTS

In the preceding discussion the focus has been on standardized multiple-choice formats for high stakes testing. This constitutes a major form of high stakes assessment. However, it should be noted that high stakes assessment might take any form including authentic assessment and informal testing practices. For example, portfolios may be used by teachers so they can review collections of student work and obtain information regarding academic gains (Jones, Jones, and Hargrove 2003). This is difficult to implement on a large scale given the time investment needed. Evaluations of portfolios in the high stakes context often require more than one rater, and reliability in scoring as well as the quality of interpretation is difficult to determine with great certainty. More complex forms of ability and skill are difficult to assess using the traditional multiple-choice standardized format.

Another type of high stakes testing is essays and writing rubrics (Jones, Jones, and Hargrove 2003). Students may be asked to write in response to an open-ended question or prompt. Two raters applying writing rubrics then grade these writing samples. These writing rubrics provide a standardized framework for scoring the essays.

Science experiments may be used as another alternative form of high stakes testing (Jones, Jones, and Hargrove 2003). In this format, students may be provided with information regarding the required study along with materials. They are asked to conduct the experiment and reflect upon the process as a learning experience. The teacher is then asked to respond to these reflections as well as provide additional information gleaned through observing the process of conducting the experiment. The teacher comments on these reflections and gives feedback prior to the written science examination. This examination is specifically focused on the process of the investigation completed by the students.

It is critical that attention be paid to alternative high stakes assessment methods regardless of the required resources (e.g., time, money). Research indicates that the impact of high stakes testing, whether positive or negative, is determined by the type of high stakes assessment employed, the pro-

fessional training provided to the teacher, the subject area being assessed, and the overall level of achievement at the school (Jones, Jones, and Hargrove 2003).

As noted earlier, there are problems with the current measures being employed in the high stakes movement. No single test should be used to make serious decisions about a students' academic future. Students with learning difficulties are disadvantaged with respect to high stakes testing. In addition, members of marginalized racial/ethnic groups—often targeted as low achievers—are also vulnerable to negative consequences of these standardized measures. Proponents of the high stakes testing movement claim that these measures are uniformly applied and establish high standards for all students. Unfortunately, educational resources and opportunities are not uniformly available, leading to achievement gaps between marginalized groups. One potentially negative consequence of testing disparities is that vulnerable populations are then subject to curriculum practices that are geared toward success on the test (e.g., drill and memorization) rather than quality education standards focusing on higher order thinking skills.

IMPROVING THE PROCESS OF HIGH STAKES TESTING

High stakes testing was initially introduced as a means of reforming what some saw as a deficiency in educational standards. However, today a number of its proponents are advocating new reforms in the high stakes testing movement itself. Based upon their review of the available literature on high stakes testing, Jones, Jones, and Hargrove (2003) conclude that the following reforms should be considered: (1) the focus should be on improved student learning and overall student achievement rather than test scores; (2) assessment results should not be used for comparison of schools or districts given that this practice does not help students; (3) continued examination of the cost (i.e., time and money) testing takes away from teaching; (4) one test should not be used in isolation for educational decisions; (5) better tests should be developed in multiple formats to reflect higher order thinking skills and problem solving; (6) necessary accommodations should be made for students with special

needs; and (7) alternatives need to be considered for student retention.

It is clear that high stakes testing has had a major impact on the educational system on a variety of levels. While proponents of this testing movement have clear reasons for their support of the use of these measures, there are negatives as well that must be considered in making decisions about the future educational opportunities of students within the diverse contexts of the public education system.

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NORM-REFERENCED TESTING

Norm-referenced tests (NRTs) refer to measures whose main purpose is to provide information regarding an individual examinee's performance relative to a norm group (or norm sample). This is in contrast to criterion-referenced tests that focus on the knowledge or skills that need to be mastered. Ronald J. Cohen and Mark E. Swerdlik note in their discussion of NRT that the norm group refers to the population sample of test takers upon which the test is based (1999). For most well normed tests, this sample reflects the demographics of the population for which the test is designed. This process is called standardization. In selecting this sample, important demographic characteristics may include gender, socioeconomic status, age, race/ethnicity, region of the country, and urban/rural status. It is critical that tests developers provide information regarding the features of the norming sample so that examiners can determine whether the test is appropriate for use with their particular student or client. In general, the more closely matched the examinee is to the norming population in terms of demographic characteristics the more appropriate the test is for use. In addition, larger norming samples are seen as beneficial since it is more likely that the test will be applicable to a wider audience depending upon the breadth of the overall norming population. Information regarding the norming sample is often provided in the technical chapters or sections of the test manual along with reliability and validity information.

EXAMPLES OF POPULAR NORM-REFERENCED TESTS

The Graduate Record Exam (GRE) is one of the major norm-referenced tests in current use today (Educational Testing Service [ETS] 1994). Many graduate level institutions require the GRE as part of the admissions process. The GRE is comprised of three parts: Verbal, Quantitative, and Analytical Writing. The Verbal section assesses reading comprehension, as well as verbal and analogical reasoning skills. The Quantitative section assesses basic concepts of arithmetic, algebra, geometry, data analysis, quantitative reasoning, and problem solving. Both the Verbal and Quantitative sections are administered in a multiple-choice format using computer adaptive scoring. Adaptive testing requires that the items administered to particular examinees be based upon the individual's performance on past items. The ETS website (ETS n.d.) indicates that three factors influence the items administered: (1) the statistical characteristics of each question answered (e.g., item difficulty level), (2) the required variety of question types (all types must be administered to a sufficient degree), and (3) the appropriate coverage of content. The Analytical Writing section is a performance test in two parts, the first requiring students to present a perspective on an issue, and the second requiring analysis of an argument. The focus of this discussion will be on the Verbal and Quantitative sections. Given the importance of the GREs in determining admission into graduate school, and the difficulties of establishing a nationally representative norming sample, the publishers note that caution should be used in interpreting GRE scores of students who "may have had an educational or cultural experience somewhat different from that of the traditional majority" (Educational Testing Service 1994, 14).

Another popular norm-referenced test is the Scholastic Aptitude Test (SAT) (College Board n.d.). The new SAT, designed to be used in 2005, will be comprised of the following: (1) a writing section (multiple choice questions on grammar and usage and a written essay), (2) a critical reading section (short reading passages added to existing long reading passages), and (3) a math section (expanded to include topics from third year college preparatory math). The analogy items and quantitative compari-

sons sections have been eliminated. Items are continually being developed by experts in the field for inclusion on the SAT. These items are pretested as part of the regular SAT examination process. This procedure enables test developers to try out items with large numbers of potential college students. Responses to these pretest items are analyzed to determine difficulty level and appropriateness for inclusion.

STATISTICAL FORMULATIONS OF NORM-REFERENCED TESTING

According to Anne Anastasi and Susana Urbina (1997), there are a number of statistical formulations that pertain to understanding the function of norms in standardized assessment. These include: (1) the normal curve, (2) measures of central tendency, (3) measures of variability, (4) developmental norms (e.g., mental age, grade equivalents, ordinal scales), and (5) within-group norms (e.g., percentiles, standard scores).

The normal curve is a mathematically derived distribution of scores resembling a bell shape. The curve indicates that the highest frequency of scores center in the middle of the range of scores and taper off at the upper and lower extremes of the score distribution. Most psychological and educational constructs that are assessed using standardized tests (e.g., personality characteristics, aptitudes) have distributions that approximate the normal curve (Anastasi and Urbina 1997). The characteristics of the normal curve form are critical to the formulation of different statistical analyses. A normal curve yields a mean score that is also at the fiftieth percentile.

Measures of central tendency reflect a score that may be viewed as representative of the overall performance of a group. These include the mean (i.e., the average of all of the scores added together and then divided by the number of examinees), the mode (the most frequently occurring score), and the median (the score reflecting the midpoint of the scores). In a frequency distribution that approximates the normal curve, the mean, median and mode will all be the same.

Measures of variability reflect the distribution (i.e., individual differences) of scores around the mean or other measure of central tendency. The measures of variability include the range, standard deviation, and

mean square deviation. The range is represented by the lowest to the highest score in the group. This measure of variability is the simplest since it relies upon only two scores in the distribution. However, the range is the least useful indicator of variability since noting the highest and lowest score reveals very limited information regarding the distribution of scores. The more frequently used statistical concept representing variability is the standard deviation. There is a clear relationship between the standard deviation and the proportion of cases when the distribution of scores approximates the normal curve. The normal curve distribution designates a particular percentage of scores that will be found based upon standard deviation units. Given that the normal curve is symmetrical, the same percentage of cases will fall on each side of the mean of the distribution, that is, 34.13 percent will fall one standard deviation above and 34.13 percent will fall one standard deviation below the mean; 99.72 percent of the cases will fall within 3 standard deviations above and below the mean.

Developmental norms provide descriptive information with respect to how an individual examinee's score reflects performance relative to a continuum of skills or abilities. For example, age-equivalent scores or age norms refer to the average performance of a sample of test takers at various ages. Age equivalents are most appropriate for subject areas taught throughout a number of grade levels.

An example of an age-equivalent indicator is mental age. Mental age is often used with respect to interpretations of intelligence test scores. In this case an examinee of a particular chronological age may score similarly to the average child at another age. Thus the examinee could have a mental age similar to the age at which he or she scored. Criticisms of this concept are that a child with a mental age much higher than the child's chronological age does not necessarily demonstrate the higher mental age with respect to all areas (i.e., socially or psychologically). Thus, the concept of mental age may be too broad to reflect the attributes of the individual. It should be noted that mental age does not increase at the same rate over the lifespan. Rather, the mental-age construct tapers off in advancing years given that the learning curve is usually steeper at younger age levels and then plateaus in the adult years.

Another example of developmental norms is grade

equivalents (or grade norms). Grade norms are established based upon the performance of students at a particular grade level (i.e., the average number of correct responses on a test for a particular grade). In order to calculate grade equivalents, the mean or median score for children at a selected grade level is computed. Given that the school year is comprised of ten months, fractions are expressed as decimals. Thus, a grade equivalent score represents the individual's performance based on the grade level in the norm sample at which the average score is the same as the examinee's score (Mather, Wendling, and Woodcock 2001). A number of limitations are associated with grade equivalents as noted by Cohen and Swerdlik (1999). For example, grade norms do not reflect the content of the type of items the examinee answered correctly or incorrectly.

Developmental norms are also available with respect to behavior development in the form of ordinal scales. These scales are based upon knowledge of developmental patterns and sequences of behavior. Ordinal scales yield information about an examinee's stage of development with respect to particular behavior functions, as well as descriptive data regarding the performance of particular tasks.

National norms refer to standardization samples that are representative of the overall country in which the test is developed. This sample is comprised of proportional representation on a number of population characteristics. These include geographic region of the country, race, ethnicity, age, socioeconomic status, and urban/rural/suburban locale. Regional or local norms are also useful in providing important reference points to evaluate an individual examinee's performance.

WITHIN GROUP NORMS

Norm-referenced tests provide information regarding how an examinee scores in relation to a particular reference group (e.g., same-age-group peers, classmates in a given school). These within-group norms provide valuable information with respect to interpretation of an examinee's test scores.

Standard Scores

A standard score is a converted raw score (i.e., number of items scored correct). A standard score is more

easily interpretable given that a standard score reflects the examinee's performance relative to others. The mean and standard deviation of raw scores is arbitrary and dependent upon the scaling and number of items on a particular measure. Standard scores have a known mean and standard deviation. For example, z scores have a mean of 0 and a standard deviation of 1. Statistically the z score is the difference between the raw score and the mean of the particular measure divided by the standard deviation. Other forms of standard scores include T scores (mean 50, standard deviation 10), and stanines (mean of 5, standard deviation of 2). Another common scale used on achievement tests places the mean standard score at 100 and the standard deviation at 15.

Percentile Scores

Percentiles reflect the percentage of test takers whose scores fall below a particular score (e.g., number of correct responses). Thus, the percentile represents an individual's position in the standardization sample. Percentiles may best be understood in relation to an obtained ranking with the top score being 100. The lower the percentile the lower the score.

While percentiles are reflective of an individual's ranking or position, they do not provide information regarding the differences between scores. Given the distribution of scores based upon the normal curve the distance between scores will be more spread out the closer one is to the mean of the distribution. Thus, the differences between raw scores will be minimized near the ends of the distribution and exaggerated in the middle of the distribution. For example, on the Woodcock-Johnson Achievement Battery, Third Edition, there is a 25-point difference in percentiles between a standard score of 100 (fiftieth percentile) and a standard score of 90 (twenty-fifth percentile). However, there is only a 7-point difference between a standard score of 80 (ninth percentile) and a standard score of 70 (second percentile).

It is not uncommon for individuals to confuse two different concepts, percentile and percentages. Percentiles differ from percentages in that the percentile is a person's ranking based on a norm group that ranges from 1 to 100, while percentage refers to the total number of items an individual answers correctly divided by the total possible and multiplied by 100.

ISSUES IMPACTING NORM-REFERENCED TESTING

A common finding with respect to norm-referenced tests is the rise in scores over time known as the saw-tooth effect (Linn 2000 cited in Jones, Jones, and Hargrove 2003). Observations of overall test scores indicate that when a new test is administered the scores are often found to be relatively low and then steadily rise over time. While some may interpret this as students doing better, most scholars attribute the rise to more focused instruction on particular skills and teaching to the test. Thus, there is a need to continually update and renorm measures that are used frequently. The content of tests may become outdated and less applicable given the quick pace of educational advancements in knowledge. As noted earlier with respect to the GRE and SAT, items are being generated continually and pre-tested to determine characteristics for inclusion on the measures.

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TEACHER ASSESSMENT

In the era of accountability in education, teacher assessment has become a major part of the licensing and credentialing process. Maintaining standards for teachers is not new, and evidence of evaluating teaching performance has been noted for over a century. Concerns regarding appropriate evaluation practices have arisen given the complexities of teaching. Issues arise with respect to who conducts the teacher evaluation and what constitutes an accurate sample of teaching performance. In addition, there is evidence to suggest that the stages of teacher development (novice to expert) will impact the type of assessment needed. For example, in the classroom, novice teachers generally use what they have been formally taught, that is, objective facts and strategies in what may be deemed a rigid format. The performance of expert teachers often appears more fluid and involves spontaneous, complex decisionmaking and problem solving within the dynamic and educational context of the particular classroom.

David C. Berliner (1989) notes that there are dif-

ferences between novice, advanced beginner, or expert teachers in the following areas: interpreting classroom information, using classroom routines, and displaying emotionality. Novice teachers have greater difficulty in determining what needs to be attended to in the classroom. For example, a novice teacher may interrupt the lesson in order to address students who are not following directions, whereas a master teacher may rely on subtle cues to reengage students. In addition, novice teachers tend not to predict, hypothesize, or make assumptions about what is occurring in the classroom, and they use different classroom frameworks in comparison to more advanced teachers.

TYPES OF TEACHER ASSESSMENT

There are generally six types of assessment used to evaluate teachers. These include: (1) written examinations, (2) assessment center exercises, (3) classroom observations, (4) portfolio assessments, (5) student evaluations, and (6) combined assessment practices (Shulman 1989).

Written Examinations

Written examinations used in teacher evaluations are comprised of measures developed to test for particular areas of competence. These tests often address basic skill areas (e.g., reading, writing, mathematics); knowledge of content with respect to a particular subject area; and understanding and applying teaching pedagogy to professional practice. These areas have been identified as part of the Praxis/National Teacher Exam (NTE) (ETS n.d.). The three stages of the exam include: Stage I (enabling skills)—reading, writing, mathematics; Stage II—measures of subject matter knowledge; and Stage III—measures designed to evaluate understanding and judgment with respect to the practice of teaching.

There are several strengths of written examinations. First, they sample broad domains of information. Second, they are economical to the extent that they are group administered and scoring is often reliable (e.g., multiple choice). In addition, the most popular teaching measures have computer-based scoring, thereby increasing the efficiency of obtaining results.

Written examinations may also include evaluative

essays requiring the application of theory, decision-making, and professional judgment. However, these essay formats have been criticized by some due to the potential for discrepancies in scoring by different judges rating the same text.

Concerns regarding the written examination extend beyond the inclusion of essays. For example, these tests are often designed to have one “right” or “correct” answer. However, teaching is a complex and contextually driven practice, and what may be deemed correct in one situation may not in another given the unique characteristics of each classroom and student group. Another concern is that in addition to evaluating decontextualized information, written examinations measure only pieces of knowledge related to teaching skills. They often do not address more challenging and sophisticated skills involving professional judgment, decisionmaking, and problem solving.

Assessment Center Exercises

Assessment center exercises include simulations of classroom situations. For example, teachers may be asked to develop a lesson plan and demonstrate their teaching skills to a new group of students. A strength of this method is that it provides a closer approximation to a real life classroom experience than paper-and-pencil tests. The limitations of assessment center exercises are that they involve greater expense to set up and evaluate teacher performance. In addition, they do not sample teaching situations broadly nor address multiple domains of content. Finally, as noted by Lee S. Shulman (1989) the assessment center does not address the shared histories between teacher and student within the learning environment.

Classroom Observations

Classroom observations constitute the most often-used mode of teacher assessment (Ellermeyer, 1992). Given the limitations noted with respect to the other methods of teacher assessment, observations are the most contextualized evaluation method. Often observations are conducted by the principal, master teacher, or curriculum supervisor and involve usage of generic rating scales examining particular teaching skills. Concerns are often raised given that observations involve only a sampling of a particular

teacher's repertoire of skills. Thus, questions can be raised regarding how many classroom visits are needed to determine a teacher's normative or typical performance. In addition, the credentials of the observer may also be called into question. Does the evaluator have adequate content knowledge to evaluate practice within that teaching domain?

Modifications of the direct observation approach may also be incorporated. For example, teachers may be videotaped conducting lessons with students. These videotapes may be reviewed with evaluators to determine teaching effectiveness. Note that these videotapes may be used as part of portfolio assessment in which the teacher selects the film that best demonstrates his/her skills as a teacher.

An understanding of the goals of the assessment process is also imperative. Is the evaluation to be used in a formative manner to provide feedback to the teacher for purposes of skill improvement? Or is the purpose of the evaluation summative, for instance, to assign a particular grade or make judgments regarding overall competence? Or is it a combination of both (i.e., the teacher receives feedback but growth must occur in the future)? The personal biases of the evaluator may enter into the process given that people may have different criteria as to what constitutes good teaching.

Portfolio Assessment

Portfolio assessment is a popular method of assessing teacher effectiveness because it focuses on actual work samples. The portfolio is a creative process through which teachers may collect samples of their work for self-evaluation as well as for examination by others invested in the educational process (e.g., supervisors, administrators, mentors). Portfolios may contain documents related to projects currently in process, completed works, and those related to evaluation from various constituents (e.g., supervisors, students). Portfolios in teacher assessment focus on the "authentic" work of the instructor as related to real experiences in the classroom. Valerie Janesick (2001) describes her personal teaching portfolio as containing: (1) a statement of beliefs about teaching, (2) a sample course syllabus, (3) a self assessment about teaching a particular course, (4) sample student evaluations, and (5) letters from students. An important aspect of portfolio assessment is that the teacher selects what the portfolio will contain.

Janesick notes that she writes a self-assessment for every course that she teaches and revises her syllabus each time she teaches a course.

Student Evaluations

In higher education, student evaluations are often used as a form of teacher assessment. Student evaluations may be used either on their own or in conjunction with other evaluations, such as portfolio assessments. A review of over sixty studies examining elementary public school students' ratings of teacher effectiveness (Follman 1995) indicated that pupil rating scales are the most common form of student evaluation. More rarely used are formal and informal interviews with students, which have been criticized due to concerns regarding reliability, validity, and objectivity. Attention needs to be paid to students' leniency, the halo effect (i.e., observer biases or preconceived perceptions will impact a teacher's evaluative judgment), and the age at which students can responsibly rate their teachers (e.g., students below grade three may not be able to accurately assess their teachers).

In addition to pupil rating scales, qualitative open-ended questions may also be utilized. Janesick (2001) notes examples of questions that may be used in teacher evaluation by students: (1) Describe what you learned and accomplished in this course and how it relates, if at all, to your program and future professional life (2) To what extent did the instructor facilitate your work in this course? (3) What qualities in the instructor facilitated your development in this course? and (4) Would you recommend this course, under what conditions, and to whom?

Combined Assessment Methods

Combining various methods of teacher assessment may be the most effective means of obtaining a comprehensive evaluation. Currently, most states require a written examination for beginning teachers and periodic observations and portfolio assessments. Shulman (1989) notes that each method of teacher assessment is limited in some way. The best solution is to include different methods of assessment. Shulman supports an assessment process over time that combines at least two of the following: (1) written examinations of knowledge and reasoning (e.g., multiple

choice and open-ended items); (2) performance assessments (e.g., simulation exercises, computer-based problems, and structured interviews); (3) observations of teaching by master teachers, administrators, or supervisors using a direct method or videotape; (4) reflective portfolios that include samples or exhibitions of student work with explanations; (5) teachers' curriculum plans; (6) student evaluations; (7) videotapes of classes; (8) other artifacts produced in the classroom; and (9) combinations of these methods.

FUTURE OF TEACHER ASSESSMENT

Given the current focus on accountability in education, it is likely that teacher assessment will continue as a major focus in examining the quality of education. Growth of professional licensure and accrediting processes ensure that attention will be paid to these important considerations in educational assessment. P. Michael Timpane (1989) poses the following questions in determining the effectiveness of teacher assessment procedures: (1) Is the system of evaluation integrated with contemporary teaching practices? (2) Is the assessment process put to appropriate use within the context of the unique school environment? (3) Is the overall conception of teaching based upon an active dynamic process or on mastery of particular rules and knowledge? (4) At what level are teachers involved in the assessment process (e.g., design, administration, interpretation)? and (5) How does the process of evaluation lead to accurate feedback to teachers and improvement of professional practice? Timpane also notes "every profession in our society must define, develop, and operate a professional assessment system and satisfy the public about it. We have not yet done so in any systematic sense in education" (p. 119). Though these words were written nearly fifteen years ago, they continue to reflect the current state of teacher assessment.

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TEST DEVELOPMENT

Developing assessment measures requires a great deal of time and perseverance. The most popular tests have

often taken years to establish and have required the expenditure of a great deal of human resources and financial capital. Entire publishing companies are currently devoted to the test development industry.

Bruce Walsh and Nancy Betz (1995), as well as Ronald J. Cohen and Mark E. Swerdlik (1999), identify five steps involved in the test development process: (1) defining the construct or area to be addressed by the measure (test conceptualization); (2) creating a large selection of items comprehensively addressing the domain of interest (test construction); (3) administration of the preliminary test to a test development sample (test tryout); (4) refinement of the item pool (item analysis and test revision); and (5) administration of the revised test and determination of reliability and validity.

DEFINING THE CONSTRUCT

Defining the construct to be examined in the new measure is the most critical step in the test development process. The developer must carefully identify all aspects of the domain of interest and operationalize (i.e., specify in behavioral and task-oriented language) what the construct encompasses and what it does not. Cohen and Swerdlik (1999) identified multiple questions to guide this process, including: (1) What are the goals of the test? (2) How is this test unique when compared with measures currently in existence assessing similar areas? (3) What domain or area will this test cover? (4) What material should be reflected in the items? (5) In what format will the items be presented? and (6) Who will be the consumers of this measure? Who will purchase it and who will take it?

As noted in the guiding questions, at this stage of the development process the creator must determine the format of the items—multiple choice, rating scale, Likert scale (five alternative responses), paired comparisons, cloze method (e.g., fill-in-the-blank), true/false, short answer, essay, and so on. Item format will in part be determined by the construct being addressed. For example, achievement tests generally follow a multiple choice, fill-in-the-blank, or true/false format given that the test is examining the individual's ability to obtain a "correct" response. Measures developed to address attitudinal dispositions may rely upon a Likert scale format that requires the respondent to indicate a degree of agreement with a particu-

lar statement (i.e., strongly agree–strongly disagree). Tests incorporating observational rating procedures or open-ended responding may also be considered. Other formats may include constructed-response tests (Green 1992), such as items requiring the examinee to structure a response in writing. This format is often used with teacher-made tests. Other examples of constructed-response formats include essay and short answer items.

The development of performance tests includes considerations of item generation focusing upon particular situational tasks. Measures in this area may include those addressing problem solving in a particular context as well as application of knowledge.

Given that educational and psychological constructs are often complex and multifaceted, examination of the literature and initial identification of test dimensions are key in stimulating ideas and providing relevant information. In cases where the test developer is creating a measure in a new area, consultation with experts working in related theoretical areas or practitioners (e.g., clinicians, teachers) who would be potential consumers of the test would be important. If there already exist measures in the area these should be examined for potential ideas and areas to address.

CREATING TEST ITEMS

In this step, items are generated that focus on the various aspects of the construct defined in the previous step. The number of items generated should exceed the number desired for the length of the final measure. For example, Cohen and Swerdlik (1999) note that for multiple-choice tests, the first draft of a standardized measure should include twice the number of items as that estimated for the final version. Other authors, like Donald Ross Green (1992), indicate that the number may need to be even higher given that anywhere from 25 percent–75 percent of the items may be rejected. Test developers may refer to related tests already in existence for assistance in creating items. Items may be adapted or modified to address components of the new test.

Green (1992) also discusses the benefits of establishing an item bank. This involves saving test items along with data regarding item characteristics. Item banks can facilitate test construction especially when multiple forms of tests are often needed. In addi-

tion, items can be written continuously and experimental items added to current test forms to obtain item data. For example, item banks may be available to teachers to assist in generating tests for particular subject areas. These item banks are often linked to particular textbooks.

One concern at this stage of development is whether or not the items appear to assess the area of interest defined by the test developer. This is known as face validity. Face validity, while not based upon a statistical examination of the data, is important in terms of how consumers view a particular measure (consumer confidence) and may impact how motivated an examinee is to perform on the test. For example, if the items are viewed as not relating to the overall goals of the test, the examinee may not be motivated to work (Cohen and Swerdlik 1999).

An important aspect of item generation is that it differs depending upon whether the test is designed to be norm referenced or criterion referenced. On a norm-referenced test it is expected that a “good” item is one in which high scorers get the item correct while low scorers do not. The same could be said for criterion-referenced tests; however, the overall goal is to determine whether individuals meet the criterion (e.g., have mastered a particular area). For more information the reader is referred to the criterion-referenced and norm-referenced test entries in this chapter.

ADMINISTRATION OF TEST TO DEVELOPMENT SAMPLE

At this stage of the development process the preliminary test draft is administered to a large pool of participants reflecting the attributes of the population to be addressed by the final instrument. Age, educational level, geographic region, gender, socioeconomic status, and race/ethnicity may be characteristics attended to with respect to the development sample.

This preliminary measure should be administered under conditions identical to those that will be used with the final version of the test. Attention should be given to how examiners are trained to administer the measure (e.g., instructions to examinees should be specified verbatim so that all participants receive the same information at the start of the test) and appropriate environmental conditions (e.g., lighting, temperature). Item responses from the development sample will be used to perform item analyses in the following step.

REFINEMENT OF THE ITEM POOL

Refinement of the item pool is accomplished primarily through item analysis. Item analysis involves statistically examining the properties of the test items. This process may take different forms depending upon the type of test. For example, items on achievement or aptitude tests would involve determining item difficulty levels. In these cases the test developer would select items that address a range of ability levels related to the group for which the test has been constructed. The test should reflect a wide range of scores approximating a normal curve distribution (see entry on norm-referenced testing in this chapter). For example, if the items on a test are too easy and all of the examinees obtain high scores, then it will be difficult to determine ability level since there is no range of comparison. In such a situation, there is no information provided with respect to how individuals differ on the particular trait or characteristic being addressed by the test. In the case of an easy test, there would not be discrimination of abilities since everyone obtained high scores. The opposite would be true if the test were constructed at too high a level (too difficult) for the population of interest, that is, if everyone obtained low scores there would be little differentiation of ability at the lower end. Item difficulty indexes are calculated based upon the number of test takers who responded to the item correctly. Thus, the item difficulty index ranges from 0 to 1. An item difficulty index of 0 would mean that none of the examinees responded correctly to the item. An item difficulty index of 1 would mean that everyone taking the test got it correct. The higher the item difficulty index the easier the item. The optimal item difficulty index is .5 with a range of approximately .3 to .8 (Cohen and Swerdlik 1999).

It should be noted that in the case of criterion-referenced testing the finding that all examinees pass at a particular level of performance would not be problematic since the criterion is based upon standards that every student should meet. The test developer may have to recycle through earlier steps (e.g., item generation) if the item analysis results in too many items being eliminated. An alternative to the item difficulty index is the item endorsement index, which would be applied more in personality

assessment where responses are not characterized as being right or wrong. Instead, the level of agreement or endorsement would be the important indicator (e.g., attitude scale).

Other procedures underlying item analysis include factor analysis and the item discrimination index. Factor analysis refers to a statistical procedure that determines whether the test items are measuring the same thing. Items that do not perform in accordance with an overall factor or factors (in the case of multidimensional tests) may be rewritten or eliminated. The item discrimination index provides information as to whether an item differentiates high scorers from low scorers on the overall test. It is often viewed as problematic when individuals who score low on a test answer a particular item correctly more often than those who score high on the overall measure. When the item discrimination index is high, this indicates that high scorers were more likely to provide a correct response to the item. Where the index is low and low scorers were more likely to answer correctly, then the item needs to be either revised or eliminated. Item analysis of multiple-choice tests may involve calculating the rate of endorsement of the correct response in comparison to the other choices or distractors. This may allow test developers to gain insights into the errors of reasoning made in selecting from among the alternative responses. Item characteristic curves based upon item difficulty and discrimination may also be derived. These curves can provide information regarding item discrimination (i.e., ability versus probability of a correct response) and help in the item selection process.

Cohen and Swerdlik (1999) also note that items can be qualitatively analyzed through interviews with examinees. The questions may be focused on issues of cultural sensitivity, face validity, behavior of the test administrator, test environment, test language, examinee's mental and physical state (before testing, during testing, after testing), and overall impressions. In addition, expert panels of reviewers may be asked to review items to determine if they are appropriate. This may be particularly useful in obtaining some information about the cultural appropriateness of the items. Experts may be asked to look for evidence of stereotyping, familiarity of information pertaining to one group, and culturally or otherwise offensive language.

DETERMINATION OF RELIABILITY AND VALIDITY

The completed test is then administered to groups of examinees to determine the reliability and validity of the test and to compute normative data. The groups involved in this process are selected with attention paid to race, ethnicity, gender, age, geographic region of the country, rural or urban residency, and so on. As noted earlier with the development sample, these groups should reflect the variety of characteristics that would be present with individuals taking the finished test.

Types of Reliability

Reliability is defined as the level of stability or internal consistency of a measure over time (Borg and Gall 1983). It may be established using multiple methods (see test theory entry)—equivalent form, test-retest, item-total correlations, odd-even split half, internal consistency, and factor analysis. Reliability can be viewed as assessing how close the measure's obtained score is to a person's "true score." There are a number of factors that can affect a person's performance on a test. These include: clarity of items, length of the test, standardization of test instructions and scoring criteria, examiner factors (e.g., the degree of training needed to assess an individual), and examinee variables (e.g., motivation of the examinee, fatigue factors).

There are several methods used to determine a test's reliability. In the test-retest approach, a sample is tested once and then retested after a certain period of time. The two sets of scores are compared to determine how close they are to each other. An issue with this approach is the amount of time between each test administration.

A second method is to develop an equivalent alternate form. An examinee's score on one form is then compared to his or her performance on the alternate form. The closer the two scores are to each other, the more reliable the test. Issues with this approach include the expense and time spent developing and standardizing a second form of the test.

A third technique is the split-half reliability method. In this approach, the test is given one time and items on the test are split into two sets, often odd and even. Each set is then compared with the other to determine how consistent the test is internally.

In cases where the measure is evaluated by the examiner's subjective judgment (e.g., tests using open ended questions), reliability is assessed through inter-rater reliability, where two or more people score a measure and the more consistent their score, the more reliable the test score is.

All of these methods make use of some form of correlation whether it is with the same test over time, an alternate form of the test or the split half technique. The statistics used in many of these methods yields a correlation coefficient known as a reliability coefficient. Reliability coefficients or estimates can range from 0.0 to 1.0. The closer the coefficient is to 1.0, the more reliable the measure. The closer it is to 0.0, the less reliable the test. Although measures of potential, more subjective and less stable variables (e.g., attitudes) may be lower, educational achievement measures with a reliability of .90 (medium) or higher is considered an appropriate level of reliability.

Types of Validity

In order for a test to have validity, it must first be reliable. A test that does not consistently measure the variable being assessed will not be a valid test of that construct or ability. Reliability is a necessary but not sufficient condition for validity to exist. For example, a scale may consistently provide a score based on a number of math questions. However, if those questions measure only addition and multiplication is supposed to be assessed, the test will be reliable without being valid.

There are a number of methods used to validate a test as noted by Cohen and Swerdlik (1999). The choice of methodology used when validating a test is based on the purpose of the exam and the type of information the validity study is meant to provide. These approaches include face validity (discussed earlier), content validity, criterion validity, and construct validity.

Content validity refers to how well a test samples the domain of interest that the measure was designed to assess. For example, depending upon the goals of an achievement test, the measure must reflect accurately the curriculum upon which the test is based. An estimate of this may be obtained by employing panels of experts to review the test content.

One of the most common types of validity assessed

by test publishers is criterion validity. This type of validity focuses on how adequately a test score can be used to speculate about an examinee's standing on a particular variable of interest. The measure of this variable (i.e., the criterion standard against which the test score is compared) is termed the criterion variable. A criterion may be a specific behavior, test score, or diagnosis. The best criteria are those that are relevant to the measure of interest, reliable and valid. Criterion validity is comprised of two major types: predictive and concurrent validity. Predictive validity is an indicator of the degree to which a test score predicts some criterion measure. Specifically, predictive validity assesses the relationship of the test administered at one point in time and a criterion measure obtained at a future time (after a particular intervening event, e.g., treatment). How well the test predicts the criterion (e.g., improvement) attests to its predictive validity. Concurrent validity is an indicator of how a test score is related to some criterion measure obtained at the same time as the test was first administered.

Construct validity refers to the appropriateness of suppositions derived from the test scores regarding how an individual scores on the construct. A construct is defined as a scientifically based idea developed to describe or explain a particular behavior. Thus, in order to establish construct validity the test developer must formulate hypotheses regarding the meaning of high or low test scores in relation to the examinees behavior. There are two forms of construct validity: convergent and divergent validity. Convergent validity refers to correlations of tests scores between the measure of interest and other measures of other related constructs. Divergent (i.e., discriminant) validity refers to correlations between test scores and other measures assessing areas not relevant to the current test being evaluated. In the case of convergent and divergent validity, determinations of what is relevant versus not relevant may be theoretically derived.

At this stage of test development it is critical to examine the scores in terms of potential test bias, which has been a focus of concern for all educational measures. For example, any systematic variation in test scores, for example based upon race or ethnicity, would be detrimental to populations of students and may render the test unfit for use due to its unfairness in assessing members of particular groups.

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TEST THEORY

Test theory refers to the application of theoretical and statistical formulations in the understanding of test measures and results. Citations in the literature regarding test theory began nearly one hundred years ago. Test theory evolved in large part due to demands for the application of statistical concepts to assist in selection and placement decisions in educational settings. This entry highlights historical and contemporary contributions of multiple researchers and their influence on test theory.

CLASSICAL TEST THEORY

According to the recent review of the historical bases of testing by Hoi Suen and Joseph French (2003), the development of classical test theory (CTT) was directed in large part by the work of Charles Spearman in 1904. Spearman posited that any score obtained on a test consisted of the sum of a true score and a random error score. The smaller the random error the closer the test score would approximate the true ability or characteristic being measured. While seemingly simplistic in its application, this conceptualization of the true score model has had major implications in both understanding the meaning and interpretation of test scores, and the development of statistical procedures applied in test construction.

The true score model posits that when tests are administered to groups of individuals, differences in scores are attributable to true score variance and error variance. The proportion of score variance ascribed to true score differences is known as the reliability coefficient. The reliability coefficient is an estimate of the precision of the test score and is derived statistically by examining the relationship between the proportion of variance in observed scores attributed to true score variance and random error variance.

It should be noted that the derivation of the reliability coefficient also was influenced by earlier work on regression and the foundations of the Pearson's r correlation. Pearson's r represents statistically the relationship between two variables. According to CTT, the observed scores of two equivalent tests can be compared if administered to the same group of individuals. The result is Pearson's r , which is the

mathematical equivalent of a reliability coefficient. Reliability is determined in two ways: administration in a test-retest format or administration of equivalent test forms (see later discussion for other forms of reliability based on internal consistency). Test-retest reliability refers to situations where the same test is administered on two occasions. Scores obtained at the first testing session are then compared to results from the second administration. The time interval between the initial testing and the repeated administration is dependent in part on the construct being assessed and the particular measure being examined. Constructs that are viewed as more stable and less vulnerable to normal life changes may be subject to longer time intervals between test administrations to limit the impact of the previous exposure to the test content. Statistical estimates derived through the test-retest method are referred to as coefficients of stability. The second way in which reliability coefficients may be derived is through the administration of equivalent tests. Thus, in the process of test development more than one version of the test may be created. These equivalent forms are then administered and the scores obtained on each are then compared statistically in the form of a correlation. This is known as the coefficient of equivalence.

As CTT evolved it was determined that longer tests (i.e., more items) yielded higher reliability coefficients. The more items on a test measuring a particular construct, the less random error was detected. The mathematical explanation for this finding became known as the Spearman-Brown prophecy formula. The development of this formula contributed to the development of internal consistency methods in estimating reliability. Internal consistency methods provided valuable alternatives to the test-retest and equivalent forms reliability indicators. One of these internal consistency models is split-half reliability. This form of reliability is based upon the correlation of two sets of scores obtained from a single test administration. First the test is divided into two equivalent halves, and then a Pearson's r is calculated. The obtained r is then adjusted using the Spearman-Brown formula (Cohen and Swerdlik 1999). There are a number of ways to split a measure. Often simply cutting the test in half is not justifiable given that earlier items may be easier than later items. One way to

split the test is to randomly assign half of the items to one section and the rest to another. Another way is to divide the test into odd and even test items. A third way is to base the split on the content of the measure. Thus, each derived scale will be equal in terms of content and difficulty.

The focus of CTT has been on standardized paper-and-pencil measures. The theory does not apply well to multifaceted testing conditions that may involve multiple raters, behavioral observations, or diverse testing designs (Suen and French 2003). Suen and French go on to note the historical contributions of Cronbach and others who developed generalizability theory (GT) as a less restrictive outgrowth of CTT based on analysis of variance. Generalizability theory is applicable to any set of measurement conditions. Thus, it can be used to estimate errors and reliability coefficients for performance assessment, portfolio assessment, and other judgment based assessment methods. One such method is the derivation of the Kuder-Richardson Formula 20 (KR-20). Cohen and Swerdlik (1999) note that the KR-20 is the statistic of choice when determining the inter-item consistency of dichotomous items (e.g., multiple choice). Another statistic is the coefficient alpha (Cronbach's alpha), which may be used on dichotomous items or nondichotomous items (e.g., attitude scales).

Suen and French note that both CTT and GT focus on the "true score" formula (i.e., observed score equals true score plus error). Neither theoretical perspective attempts to assess the true score directly as some degree of error is always assumed to be present.

ITEM RESPONSE THEORY

Robert J. Mislevy (1993) notes that both Item Response Theory (IRT) and CTT/GT are concerned with the overall test performance of examinees. However, as noted earlier, CTT and GT do not address issues related to the origin or reasons for the obtained score. IRT on the other hand, supports the formulation of mathematical models that reflect relationships between observable variables and hypothesized traits (Suen and French 2003). For example, when applied to achievement tests, test items are often administered to individuals and the computer records the responses. The computer then generates

mathematical models representing the probability that a given examinee will correctly answer another item that has not yet been administered. Thus, IRT provides insight into the relationship between the responses to test items and estimates of ability and achievement. One can hypothesize about the examinee's overall level of achievement or ability in a defined area based upon performance on the test. When item characteristics are known then IRT (also known as latent-trait theory) indicates that an estimate of the examinee's true ability can be ascertained based upon the sample of item responses obtained on the test.

It has been shown that IRT does not necessarily take into consideration the finding that high-scoring examinees may miss "easy" items, and low-scoring examinees may get "hard" items correct. Therefore, Mislevy (1993) notes that IRT may not reflect all of the information contained in item responses and total test scores. In addition, IRT does not measure learning because the function of the mathematical model is based upon the examinees' chances of obtaining a correct response based upon characteristics of the items. According to Mislevy (1993), a single IRT model cannot pre- and post-test data since it cannot reveal how students learn topics at different degrees or rates of efficiency.

Research comparing the performance of novices and experts has provided enlightening information on the process of learning. Although experts have mastery over more facts and concepts than novices, the differences extend even further. The ways in which experts organize their knowledge (e.g., schemas, chunking of information) is qualitatively different. In addition, information is more automatized and readily accessible based in part on increasing levels of practice and study. Mislevy notes that the challenge in

education is to discover "what experiences help a learner with a given configuration of propositions, skills, and connections to reconfigure that knowledge into a more powerful arrangement" (p. 28).

CONTEMPORARY TEST THEORIES

Limitations of CTT and IRT are noted in that they cannot assess qualitative differences in ability levels or developmental processes. In addition, they tend to assess ability in terms of quantity using a single unidimensional scale without attending to the problem solving process the examinee goes through to answer items correctly (Schnipke and Scrams 2002). Research in cognitive psychology and detailed analysis of the learning process informs more contemporary test theories. For example, graphic modeling (GM) theory extends current IRT to include complex multivariate assessment models.

The text edited by Norman Frederiksen, Robert J. Mislevy, and Isaac I. Bejar (1993) entitled *Test Theory for a New Generation of Tests* provides some insights into the future directions taken in understanding test theory that began over a decade ago. Braun (1993) notes that CTT and IRT are no longer adequate to explain what is currently known about the formation of human abilities. These statistical models cannot address the complexity currently acknowledged with respect to the nature of human ability and the learning process. In an era of increasing technological sophistication and high-stakes accountability, the field of test theory is growing to accommodate increasing knowledge in our quest to understand aspects of human learning.

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ISSUES AND TRENDS IN SUBJECT MATTER KNOWLEDGE

In this chapter, we discuss six key content areas that have shaped the curricula of both public and private schools from preschool through secondary school. These content areas include language arts, mathematics, music, science, social studies/history, and the visual arts. Common to all of these content areas is the development of standards. The curriculum reform agenda and philosophy of the late twentieth and early twenty-first centuries calls for excellence for both teaching and learning. Presidential candidates during this period have each marshaled in federal programs. Each of the following legislative acts—*America 2000* initiated by President George H. W. Bush, *Goals 2000* promoted by President Bill Clinton, and the *No Child Left Behind Act* (NCLB) promoted by President George W. Bush—identifies practices to improve the quality of America’s schools. At the core of each of these reform movements were standards and ways to assess that these standards have been met.

The term “standards” may be used in numerous ways. In general, there are content standards, curriculum standards, and performance standards. Content standards identify the concepts and skills that should be obtained in a course of study. Curriculum standards identify the goals and objectives of a discipline and organize the subject matter. Performance standards describe a demonstrated level of competency. What drives each of these standards is the increased demand for accountability from educational systems. It can be argued that an increase in measures of accountability stems from the government report in 1983 (written by the National Commission on Excellence in Education) known as *A Nation at Risk*.

The comments in the Report state, “Our society and its educational institutions seem to have lost sight of the basic purpose of schooling, and of the high

expectations and disciplined effort needed to obtain them” (pp. 5–6). This statement has served as the clarion call that established numerous national commission reports that were highly critical of public education. The national commission reports of the 1980s supplied the impetus to question the abilities of local and state governments and institutions of higher education and their role in education. National Commission Reports of the 1980s stemming from *A Nation at Risk* include:

- High School: A Report on Secondary Education in America (Boyer 1985)
- A Place Called School: Prospects for the Future (Goodlad 1984)
- Making the Grade: The Twentieth-Century Fund Task Force on Federal Elementary and Secondary Education Policy (Twentieth-Century Fund Task Force 1983)
- Horace’s Compromise: The Dilemma of the American High School (Sizer 1984)
- America’s Competitive Challenge: The Need for a National Response (Business–Higher Education Forum 1983)
- Action for Excellence: A Comprehensive Plan to Improve Our Nation’s Schools, Education Commission of the States Task Force on Education for Economic Growth (Education Commission of the States 1983)
- Educating Americans for the 21st Century: A Report to the American People and the National Science Board (National Science Board 1983)

It is interesting to note that almost all disciplines of study were affected by some type of governmental oversight and a written outcome in the form of a report. Each of these reports generated a required inter-

est in methods of assessment to measure educational achievement. The National Center for Education Statistics (NCES) was responsible for the measurement of achievement at the national level through high stakes testing. The national testing program is known as the National Assessment of Educational Progress (NAEP) and was based on the standards developed by each discipline. At present, NAEP (2003) administers tests in the arts, civics, economics, foreign language, geography, mathematics, reading, science, U.S. history, world history, and writing. The standards provide a reference for both content and process skills in developing instruments for assessment. The assessments measure the content, curriculum, and performance levels of the students. The standards outline what students need to know, understand, and be able to do at different grade levels. The standards for teachers generally include objectives for teaching, professional development, assessment, and required content. In addition, certain national organizations' standards have gone as far as to identify the requirements for educational programs and educational systems. Measures of accountability have also reached institutions of higher education. For example, national organizations such as the National Council for the Accreditation of Teacher Education (NCATE), Teacher Education Accreditation Consortium (TEAC), and the National Board for Professional Teaching Standards (NBPTS) have also developed standards for each of the disciplines involving teacher education. At the state level, the Interstate New Teacher Assessment and Support Consortium (INTASC) was established in 1987 by the Council of Chief State Officers (CCSO). INTASC is comprised of national education organizations, state agencies, institutions of higher education involved in the reform of education, initial teacher licensing, and continuing professional development of teachers. INTASC has ten principles related to knowledge, dispositions, and performances expected of a beginning teacher. To avoid the problem of competing paradigms, each of the agencies' standards is interchangeable (see Table 4.1).

The standards movement has changed the manner in which teacher education institutions prepare teachers. It is suggested that the models of teacher education have changed from input measures (e.g., numbers of classes, type of degree, number of teaching hours, grade point average) to output measures (e.g., performance related activities). As a result of this change,

researchers in various fields have questioned the utility of the standards (Delandshere and Petrosky 1998; Johnson and Erion 1991; Kraft 2001; Walsh 2001). In fact, much has been written to suggest that there is no clear consensus in the field of education regarding the content represented by the standards, nor is there empirical evidence to support higher education achievement (Johnson and Erion 1991; Kraft 2001; National Research Council 2001).

Each of the entries in this chapter will address the issues and concerns with distinct subject area disciplines throughout the grade levels. Each discipline is represented by a specialized professional association, often referred to by its acronym—SPA. The SPAs are responsible for deciding what is important in terms of content, process, and product in their respective disciplines. This is accomplished through consensus among its representatives. Each of these associations has determined its own set of standards that must be met in order for a teacher education institution to become nationally recognized. The associations publish guidelines and directions that teacher education institutions must follow in order to achieve accreditation. Each of the disciplines is associated at the national level with either a SPA or a set of standards that have been developed to guide study within the discipline. They are: (1) the National Council of Teachers of English (English/Language Arts); (2) the National Council of Teachers of Mathematics (Mathematics); (3) the National Association for Music Educators (Music); (4) the National Science Teachers Association; (5) the National Council for the Social Studies (Social Studies/History); and (6) the National Standards for Art Education (Visual Arts).

Stephen J. Farenga and Daniel Ness

LANGUAGE ARTS

The term language arts includes reading, writing, speaking, listening, and, more recent additions, viewing and visually representing that which is understood as language. From infancy onward, these aspects of language arts interact with developmental cognitive stages; in due course, with appropriate educational experiences, this “joining” results in higher level reasoning.

Table 4.1

List of National Standards for Teacher Education

NCATE Standards	NBPTS Standards	INTASC Principles
1. Candidate Knowledge, Skills, and Dispositions	1. Teachers are committed to students and their learning	1. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.
2. Assessment System and Unit Evaluation	2. Teachers know the subjects they teach and how to teach those subjects to students	2. The teacher understands how children learn and develop, and can provide learning opportunities that support their intellectual, social, and personal development.
3. Field Experiences and Clinical Practice	3. Teachers are responsible for managing and monitoring student learning	3. The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
4. Diversity	4. Teachers think systematically about their practice and learn from experience	4. The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
5. Faculty Qualifications, Performance, and Development	5. Teachers are members of learning communities	5. The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
6. Unit Governance and Resources		6. The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
		7. The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.
		8. The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner.
		9. The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.
		10. The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well being.

Source: NCATE 2002; NBPTS 1996.

First, each of the various aspects that constitutes the whole needs to be defined. Speaking refers to the use of language (words) to communicate on a progressively more sophisticated level; listening is the ability to understand the increasingly complex messages; reading refers to the explicit and implicit understanding of the message inherent within the words that appear on the printed page; writing is the cognitive culmination of the above to express knowledge, ideas, feelings, and/or thoughts in written form. Viewing refers to the perception critical to the “knowing” of what has been sent; reading is

really a cognitive and not a visual process. “Seeing” is achieved by the eyes in the role of a camera; the brain becomes the translator. Visual representation is the manner in which the message is sent without the use of speech.

Infants have the capacity to make sounds, to hear the noises within their environments, and to utilize rudimentary perception. Eventually, with appropriate educational experiences, the adults’ innate syntactical structures become more mature and complex as the interrelatedness of language arts expresses itself in higher level reasoning.

BACKGROUND AND PHILOSOPHICAL UNDERPINNINGS

Past discussion and research regarding the development of language arts (speaking, listening, reading and writing), would make up its own encyclopedia. Thousands of years ago, early people used language arts to communicate life experiences; cave drawings told stories of events that could be comprehended by others. These were the early visual representations that continue to be “read” and comprehended by literate adults today.

Early sounds or speech allowed for communication between peoples. Linguists suggest that clicking was part of primitive languages; similarities among various languages today identify “families.” Even the kinds of words that have evolved connote a common cultural heritage. Many synonyms for snow identify nations’ climatic history; speech that specifically differentiates between maternal or paternal relatives offers up cultural patterns; languages that ignore tenses suggest other concepts of time.

Speech itself is universal; infants in their cribs enunciate sounds known to all the languages in the world. As children hear specific “noises” in their cultures, they repeat those necessary for their environment. Other sounds, alien to their particular society, are lost and difficult to regenerate later.

Certain aspects of syntax are also innate, as originally suggested by Noam Chomsky (1965). The noun is the first part of speech that all children use, usually the simple name for their major caregiver, “ma” or “pa.” The second part of speech to be used, also universal, is that of the verb. Even such simple syntactic structures as plurals and tenses must be coded in the evolutionary process. Who has not heard a child refer to “gooses” and “oxes” and “runned” and “goed?” Certainly, the youngsters have never heard adults utter such words; children overgeneralize the rules that identify “s” as a plural definer and “ed” as a past tense selector.

In the same evolutionary pattern, the first sentence structure that a child uses is that of a simple action. An example of this is: “My mother runs.” Eventually, even this simple structure is elaborated upon with the introduction of adjectives and adverbs and phrases, such as “My charming mother runs quickly into the street.” The next sentence structure that appears is that of the compound sentence such as “My mother runs and my father walks.” Again, with

maturation, this sentence is engulfed with qualifiers. The final and most sophisticated of possible sentence structures is the complex sentence; this syntactic structure requires a level of thinking that notes relationships between and among parts of the sentence. In this structure, “when my mother runs then my father walks,” the creator has recognized cause and effect. Thus, this ability coupled with the embedding of ideas in as terse and clear a manner as possible is the ultimate recognition of reasoning in writing (first noted by O’Hare 1973).

Carol Chomsky (1972), in her research, indicated that the understanding of the passive voice is also developmental. When young children are asked to explain “the doll is easy to see,” they perceive the doll as doing the seeing. Understanding of the sentence comes as the reasoning processes of the youngster matures. The masters of writing are those who have the education, the knowledge base, the skill in reading, and the higher level reasoning that allows them to comfortably use different voices and complex and embedded sentences.

Reading, early in our history, was viewed as a skill that needed to be limited to the aristocracy. Thus, up to the eighteenth century, reading and writing were not the province of the common man. In fact, even the Bible was viewed as too seditious to be within the realm of the average person; only a bona fide leader of the church could translate what was being said and its meaning. The concept that all people in a society have the right to learn to read and write is radical; such a premise requires a government that either espouses democratic ideals and/or needs a literate populace for economic progress. As has been noted by writers and philosophers for hundreds of years: “The pen is mightier than the sword” (Andrews 1993). Or, as translated in a later century by John Dewey (1962), the purpose of education is to develop citizens, therefore, the populace must be literate. Such a state is possible only if the individuals reach the Piagetian cognitive stage of formal operations or abstract reasoning.

CURRENT PRACTICES IN PSYCHOLOGY

The decision to encourage a literate nation requires people who can speak, listen, read, write, and rea-

son. Head Start is a federal program that has proven that it can educate minority children in all the pre-skills required for reading. The results of this program have been statistically significant in preventing school dropouts (approximately 25 percent of the American population are not graduated from high school), and in encouraging women to raise families at a later age so that they can first complete their education.

While the schools periodically suggest that very young children should learn to decode, research clearly establishes that differences in letter shapes require a somewhat older child. Instead, early emphasis is on listening to fine children's literature so that youngsters hear the rhythm and nuance of language and then on the teaching of pre-reading skills. Marie Clay (1985) notes that children who evidence early difficulties in learning to read seem to have problems throughout their school careers. Thus, she introduced an effective remedial program that selects early problem readers and provides them with expert, one-on-one support.

Prior to the dissemination of her program, researchers attempted to select the one best method to teach first graders how to read. Bond and Dykstra's (1967) study noted that the single most important variable was not the method but the teacher who needed to have an expertise in the field and believe that all children can learn. If these criteria were met, almost all the youngsters would learn to read, no matter what the method. Other researchers expanded these results by indicating that youngsters more easily learned to read and write when the materials were meaningful and purposeful to them and that great literature spoke to children above and beyond the printed page.

Unfortunately, those who cannot decode are prevented from amassing the knowledge base that is associated with the act of reading and from increasing the depth and breadth of their vocabulary. This latter skill correlates highly to intelligence; excellent and extensive reading guarantees an enriched vocabulary that allows the speaker to hone in on specificity of thought and action. Thus, a good reader, as Frank Smith (1982) noted, recognizes that reading is a "psycholinguistic guessing game" and that the more information the reader actively brings to the process, the easier the new knowledge will be incorporated within the known.

Earlier than Smith's clarification of the steps in the reading process, researchers were curious as to how children learned to comprehend and why some didn't once they could decode. Thus, they moved from "learning to read" to "reading to learn" (usually around third grade) In Delores Durkin's (1978/79) study, she visited classrooms to observe the methods used for teaching comprehension. She saw none; Durkin questioned how some children learn to comprehend since no one seems to be teaching strategies.

Since then, the emphasis is on encouraging and uniting students' reasoning and reading comprehension. The logician George Henry (1974) perceived of reading and English as two sides of the same coin that need to be joined together. Further, Henry's premise is that learning occurs when teachers use universal themes whose ideas are explored through the reading of the best examples of the literary genres. In this manner, all of language arts is integrated; this method can be extended to the integration of other disciplines. To Henry, the art of learning was creative, utilizing both analysis (noting differences) and synthesis (seeing similarities) within each universal theme and subtheme. Thus, students are encouraged to see, within the literary selections, the similar in the different and the disparate in the familiar. In this manner, the students create new concepts that have not existed previously. Other researchers suggest that all novel and creative ideas are based upon the similar in the disparate. In this manner, the mystery of DNA is unraveled; the strands are mirror images. In great literature, such as *The Grapes of Wrath* by John Steinbeck, the characters represent the opposing concepts of life and death, love and hate, good and evil, and so forth.

Then comes the question of how we begin the teaching of reading in language arts. Is it a "bottom-up" or a "top-down" process? The former concept suggests that learning is made up of discrete isolated bits of information. Thus, the bottom-up concept of learning to read requires first the understanding of the alphabet, then the sound-symbol system (phonics), then simple words, then very easy books, then step-by-step movement up the learning ladder. The top-down process champions the idea that first students read the book, then they look at words and, eventually, they understand the concept of letters and sounds. Strict adherence to either approach has given

us the constant battle between phonics and “whole language.” This either/or approach led to the failure of the California system that attempted to only use “whole language,” which was, itself, an answer to the failure of the phonics system alone.

Some decades ago, standardized reading tests assumed that any error was as valid and significant as any other. Thus, if the reader used an “an” instead of a “the,” this mistake was viewed as seriously as if the reader called an elephant a giraffe and both “differences” would be considered equal. It was only when Kenneth Goodman (1965), took another look at reading tests and devised the Miscue Analysis that a more judicious viewpoint was interjected. In this approach, errors are judged by whether or not they change the meaning of the reading. For example, if a child says “home” instead of “house,” the meaning of the passage has not been jeopardized. However, should the youngster state “elephant” instead of “house” then that is an error because the meaning, which is considered the purpose of reading, has been changed.

The National Assessment of Educational Progress (2003) tests the reading and writing prowess of American children in grades four, eight and twelve. In 2002, the reading progress of students in grades four and eight showed an increase over 1992, even though it was not statistically significant; for grade twelve, the scores in 2002 were below that of 1992.

The correlation between reading and writing is quite clear. Anyone who is considered a good writer is also known to be a good reader. The reverse does not necessarily hold. Just because an individual can read well does not mean that superior writing will ensue. Contrary to this rather obvious correlation, writing was taught as an isolated subject until quite recently. It was only when O’Hare began his studies that a logical understanding of what constitutes more sophisticated writing was attempted. The sense was that writing becomes more complex as the individual uses more sophisticated sentences and can embed ideas. Such growth continues throughout an individual’s lifetime. Thus, the most mature writing is noted in people who have at least a college education and who write for a living and whose written work is found in magazines the caliber of *The Atlantic Monthly*.

From this beginning and the more inclusive concept of language arts as requiring reasoning, writing

is viewed as a more complex activity than simply checking for grammatical and spelling accuracy.

Thus began the writing corollary to the new reading approach. Researchers such as Graves (1994) and Calkins (1983) note the significance of the writing process as a way of developing recursive, thinking writings. In this approach, approximately three-quarters of the time is spent on the “front end” aspect of writing. That is, the selection of a topic, brainstorming, categorizing, “chunking,” outlining, and writing the first sentence of each paragraph. The first draft takes a minimal amount of time. The remaining efforts are used for revising and editing. This approach encourages writers to recognize the importance of thinking in writing; correct grammar, while necessary, is really only a minimal aspect; the paramount emphasis is on the ability to effectively communicate.

The National Assessment of Educational Progress that tests the writing prowess of students every four years was last administered in 2002. The grade levels that appear in these tests are grades four, eight, and twelve. The percentage of fourth-graders who scored at or above “basic” and at or above “proficient” increased between 1998 and 2002. The percentage of eighth graders at or above Basic decreased from 1998 to 2002 but the Proficient level increased between 1998 and 2002. However, for grade twelve, the percentages of Basic decreased between 1998 and 2002.

Perhaps the higher grades for fourth and eighth grade may suggest that we are finally beginning to offer our students appropriate educational experiences in language arts so that they may achieve to their potential and develop metacognitive skills. However, the decline in the writing scores of twelfth graders may suggest that the educational system has not yet instituted an integrated language arts experience that includes the writing process; such a program can guarantee literacy for all students.

EFFECTIVE PRACTICE IN LANGUAGE ARTS EDUCATION

Those programs that are developed based upon research in the field are the ones that are most successful. They use an integrated approach to language arts for all children throughout the learning curve. From

their earliest days, youngsters need a language-rich environment that broadens and deepens throughout a lifetime. In this manner, children absorb the richness and ambiguity of language, from nursery rhymes to the best examples of all literary genres. From the beginning, letters and sounds, phonemes and graphemes, are presented in an integrated fashion.

The classrooms that utilize “big books” provide the opportunity for all children to follow story patterns and to absorb the redundancy of language learning. Elementary school youngsters are introduced to the language experience approach; they write, as a class, about events that are within their knowledge base and are, therefore, meaningful and purposeful to them. As children are introduced to the best examples of all literary genres, they mimic the form and voice of the author in their own writing.

Successful language arts programs are found wherever integrated learning unites models of reasoning, reading, and writing in a significant and resolute manner. These programs are located in schools and districts where the educators are themselves knowledgeable and committed. While higher socioeconomic communities have more money, they have no lock on quality as witnessed by *Schools that Work* (Allington and Cunningham 1996) and Stracher’s (2002) discussion of what a South Bronx elementary school could achieve in its language arts program.

In the same manner in which all children need to discover the magic of language through their own zone of proximal development (Vygotsky 1978), so too do all districts need to claim ownership for their language arts programs. Programs that are imposed upon schools are almost guaranteed to fail. Rather, those districts whose staff meet together to determine what standards will be established for the K–12 language arts program and its implementation are the most effective (Miller 1998).

In addition, effective language arts practice includes those students whose learning problems are usually centered on decoding and spelling deficits. Modern technology allows for the “reading” of books via tapes and audiovisuals. The use of spell check on computers lessens the problems of orthographic uncertainty. Thus, these youngsters, also, can then achieve to their potential.

Further, to provide for maximum writing growth, language arts programs support reflective journal writing; in some, students opt to “dialogue” with

the teacher about perceptions of the class or readings or experiences. Portfolios establish the independence of students who include those writings perceived as representing their unique qualities as effective communicators. Often, the writers include their brainstorming, rough drafts, and revisions; all of which indicate the efforts expended for clarity of communication. The reality is that “Becoming a good writer or teacher of writing requires education and experience and it is always labour intensive” (Klein and Olson 2001, 234).

When youngsters view themselves as authors, they take the writing process seriously and begin to make sense of their lives through their own readings. Of course, such accomplishments require not only competent and committed teachers who believe that they “own” the process, but administrators and communities who share in the goal and its responsibilities (Chihak 1999).

To summarize, those language arts programs that make a significant difference in the achievement of their students unite well-qualified teachers who continue to receive excellent in-service training, who believe that their students can and will succeed, who can provide a one-to-one remedial program for those language arts students who require such service, who utilize the finest literary genre examples, and who integrate all learning (Robinson 1991; Briggs and Clark 1997; Slavin et al. 1994).

Effective language arts programs develop life-long learners who are forever entranced by the magic and power of words, speech, stories, and writing as they translate their knowledge into positive action.

Dorothy A. Stracher

MATHEMATICS EDUCATION

Today, no one can live without mathematics. At work and at home, while reading, relaxing, shopping, interacting with others, and making practical decisions, people are compelled to make use of mathematics, and often to employ its language and methods. The goal of a mathematics education is to prepare students for these tasks, as well as to provide for the further development of new mathematics knowledge.

HISTORY OF MATHEMATICS EDUCATION

The origins of mathematics education date to pre-historic times, when people were first faced with the necessity of comparing, counting, and measuring, and thus of applying mathematics—in however primitive a form—and teaching others how to apply it. Papyrus scrolls from ancient Egypt and clay tablets from Babylon which have survived to present times testify to the relatively high level of proficiency at problem solving that was achieved by these civilizations (Eves 1990). Most likely, most of these materials were composed as manuals or textbooks for the instruction of clerks or priests who had to carry out practical calculations.

In ancient Greece and during the Hellenistic period, schools appeared that offered a deep and systematic course in mathematics. One of the first examples of research in mathematics education is presented in Plato's *Meno*. In this piece Socrates conducts a discussion with an observer about teaching mathematics concepts to a young boy. Euclid's *Elements*, which for centuries remained the basic source of learning in geometry, was written as a textbook for these schools. Van der Waerden (1961), a historian of mathematics and a mathematician in his own right, justly calls Euclid (about 325 B.C.E. to about 265 B.C.E.) the greatest mathematics teacher of all time.

In Medieval Europe, mathematics education (along with other branches of culture) underwent a decline. Familiarity with four of the thirteen books of the *Elements* was considered proof of a deep grasp of geometry. Still, the seven liberal arts—the seven disciplines that comprised medieval education—included geometry and arithmetic.

In the East (China, India, and the Arab world), mathematics and mathematics education were for many centuries much better developed than in Europe. The discovery of the mathematics of the Arab world contributed to the rise of mathematics in the West at the end of the Middle Ages. An equally important role was played by various social developments. The sociologist Max Weber (1958) wrote about the “disenchantment” of the world that took place during this period. People began to describe the world in terms that were rational and scientific rather than irrational and mysterious. Developing and

using mathematics knowledge constituted an integral part of an increasingly rational orientation toward nature, and mathematics became a means of both understanding the world and solving practical problems.

Beginning in the sixteenth and seventeenth centuries, many more people started studying mathematics than ever before. More and more thought came to be devoted to how mathematics should be taught in class and how textbooks should be written. Elementary mathematics education became more and more widespread in schools. Higher mathematics education, offered in various colleges and universities, also gradually stopped being the province of the privileged few. In the remaining discussion of mathematics education below, we generally focus on K–12 mathematics education within schools.

The development of mathematics teaching in the United States is well documented in the fundamental *History of School Mathematics* edited by George Stanic and Jeremy Kilpatrick (2003). The first school textbooks used in America were borrowed from England. They were devoted to arithmetic, which constituted a vocational subject essential for merchants and craftsmen. The enormous number of rules that had to be memorized without being explained in any way made the subject quite a difficult one. Benjamin Franklin, for example, failed it twice as a child (Cohen 2003).

Gradually, mathematics education started making use of more novel pedagogical techniques. Warren Colburn, a follower of the influential Swiss pedagogue Johann Heinrich Pestalozzi and the author of a textbook *An Arithmetic on the Plan of Pestalozzi with Some Improvements* (1821) that by the 1850s had sold more than two million copies, advised teachers to pose problems in such a way that students could “discover what is to be done, and invent a way to do it” on their own (Cohen 2003, p. 58). Likewise, in teaching algebra and geometry, efforts were made to make these subjects “more comprehensive, dynamic, and functional in character,” as the author of geometry textbooks John Swenson wrote in the 1930s (Donoghue 2003a, 347).

Mathematics education came to be seen as an independent area of professional research. At the very end of the nineteenth century, preparatory programs for high school mathematics teachers began operating in the United States. At the beginning of the twen-

tieth century, they were followed by graduate programs devoted to mathematics education. Mathematics education journals emerged around this same time. The first issue of *The Mathematics Teacher*, which is today the most popular periodical devoted to mathematics education, was published in 1908. The largest national associations of mathematics educators—the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM)—appeared in 1915 and 1920, respectively (Donoghue 2003b). In 1908 David Eugene Smith, a professor at Teachers College, Columbia University, proposed the establishment of an international commission on mathematics education. This commission has continued to function (with an interruption of activity between the two world wars). Since 1969 this commission conducts worldwide congresses once every four years at which mathematics educators from around the world have the opportunity to exchange their views and findings.

MATHEMATICS IN K-12 EDUCATION

The contemporary K–12 course in mathematics may be summarized using the five content standards of the NCTM (2000): number and operations, algebra, geometry, measurement, and data analysis. Data analysis and discrete mathematics, as studied in various elementary and secondary school courses, are relatively new fields in K–12 education. The fact that they are now studied in school reflects contemporary society's need to process enormous amounts of new information. Studying and using numbers, using algebraic symbolism, solving equations or inequalities, analyzing various characteristics of two- and three-dimensional shapes, using various techniques for measuring areas and volumes—all of these are classical topics in mathematics education. However, today, due to technological developments, the interdisciplinary nature of many school subjects, and developments of our understanding of mathematics and mathematics learning, both old and new areas of mathematics must be studied in new ways.

The NCTM has expressed this need by formulating five process standards: problem solving, reasoning and proof, communication, connections, and Representation. In learning school mathematics, students must not see it as a frozen subject that has to

be learned, but as a science in which new problems constantly arise—a science that is open to creativity, including their own individual creativity that uses reasoning as an instrument. Students must see mathematics as being useful for all types of human activities, and they must understand that its branches are not detached from one another but interconnected by countless links. Students must come to understand graphs, tables, diagrams, symbols, and other forms of representing information; they must also learn to express their ideas in mathematical language and to present information in different ways.

The NCTM team of mathematics educators (including Joan Ferrini-Mundy, Jeane Joyner, W. Gary Martin, Barbara Reys, Alan Schoenfeld, and Edward A. Silver) developed content and process standards, as well as principles (to be discussed below). The NCTM's focus on content as well as process standards has its roots in historical and contemporary debates about mathematics education. Since the very beginnings of the establishment of mathematics education as a field, mathematics educators, mathematicians, other educators, and various interested parties (including parents, businesspeople, policymakers, politicians, and college faculty and administrators) have debated various aspects of mathematics education and its research. These debates about how mathematics should be taught and learned have been so vigorous that observers have referred to them as the "Math Wars." What *are* the best ways for teachers to teach mathematics and for students to learn mathematics? While most would agree that there is no single way to answer this question, cyclical shifts in beliefs about mathematics education continue to occur. At some periods in mathematics education history, a focus on basic skills teaching and learning to improve students' mathematical knowledge predominated. At other times, a focus on developing transferable problem solving skills and conceptual understanding of mathematics concepts was prevalent. Textbooks, other curricular materials and their uses, standardized assessments, and teacher training resources all reflect these sometimes competing ideas about what constitutes the best methods and philosophies of teaching and learning mathematics. In addition, current discussions of research paradigms in mathematics education reflect this tension—with some advocating the use of random assignment in statistical studies to determine which mathematics

curricular programs improve mathematics achievement, others advocating narrative descriptions of emerging and/or effective mathematics teaching and learning practices, and still others advocating a combination of these two approaches.

INFLUENCES ON CONTEMPORARY MATHEMATICS EDUCATION

These contemporary questions about what constitutes mathematics education can be viewed from sociological, psychological, and cultural as well as mathematical perspectives. Mathematics education, as well as education in general, has at different times been significantly influenced by the work of psychologists, including Edward L. Thorndike (1874–1949), Max Wertheimer (1880–1943), Jean Piaget (1896–1980), and Lev Vygotsky (1896–1934). In particular, Piaget, who studied the development of the human intellect, indicated the limits of what can be achieved by mathematics education at each stage of development and suggested ways in which mathematics education should be structured. Theories of constructivism, which took shape under the influence of Piaget's (1995) and Vygotsky's (1986) work, have been highly influential in mathematics education.

A watershed in the development of mathematics education is represented by the works of the mathematician George Polya (1887–1985), which contain profound discussions of mathematical creativity, considered as something accessible not merely to professional mathematicians, but to laypeople and students as well. Polya (1954, 1973, 1981) drew attention to the effectiveness of teaching problem solving to all students, described a series of heuristics useful for problem solving, and offered numerous valuable observations and pedagogical recommendations.

These (and other) theories are reflected in the ways in which the contemporary philosophy that all should learn high quality mathematics is enacted in teaching, learning, and assessment. In particular, constructivist theories pertaining to mathematics education integrate theoretical discussions of culture, pedagogy, and students' prior mathematics knowledge. These have influenced the development of curricula and teaching strategies to help students generate knowledge based on some of their own out-of-school as well as in-school experiences with math-

ematics. Culturally relevant pedagogy and multicultural education, two recently emerging areas of educational theory, also seek to address the shifts in teaching practice and philosophy that have come with the new emphasis on "mathematics for all." Educational theorists Gloria Ladson Billings (1995) and James and Cherry Banks (2004) have written that these new frameworks were developed to address historical and current inequities in the education of students of color in the United States.

CHALLENGES FACING U.S. MATHEMATICS EDUCATION

There are many challenges facing U.S. mathematics education, from external as well as internal sources. In recent years, the mathematics achievement of U.S. students has been compared to that of students in other countries through large-scale comparison studies such as the TIMSS (Trends in International Mathematics and Science Study, formerly known as the Third International Mathematics and Science Study) conducted in 1995, 1999, and 2003. TIMSS revealed that on average (and with the exception of a few subtopics), U.S. eighth grade students most often performed as well as students from several countries, including Bulgaria, England, and New Zealand. They performed less well than students from a number of countries, including Singapore, South Korea, Japan, the Russian Federation, and Australia. Researchers have pointed out that differences in performance may be in part explained by national differences in curriculum, teacher education and development, and population characteristics. James Hiebert, Liping Ma, Curtis McKnight, William Schmidt, Howard Stevenson, and James Stigler, among others, have conducted comparative research exploring factors affecting mathematics teaching and learning in the United States and other countries (Ma 1999; Schmidt et al. 2001; Stevenson and Stigler 1992; Stigler and Hiebert 1999). This research has helped to promulgate ideas about revamping mathematics curriculum, assessment, teaching, and learning in the United States. Findings from TIMSS and other related studies have affected policy regarding mathematics education in many countries. For example, based on U.S. student performance in TIMSS, several U.S. presidents (e.g., William J. Clinton and George W. Bush) and their administrations publicly paid greater attention to mathematics education.

Recent and sitting presidents have all made public statements regarding U.S. mathematics performance in the world and instituted national policy recommendations focusing on national testing and teacher development for improving mathematics performance.

Within the United States, a major problem in mathematics education is the diminishing numbers of students enrolling in mathematics throughout secondary and postsecondary education. In the early 1990s, from ninth grade on, roughly half of the school population dropped out of mathematics in any given year. David Lutzer of the American Mathematical Society writes that of the nearly 12 million U.S. students graduating from college in 1998 only 1.05 percent (or approximately 12,000) were mathematics majors. He estimates that only about 3.8 percent of mathematics degree holders go on to earn advanced degrees in mathematics (Lutzer 2003). Because shifts in the nature of employment in the United States have led to the creation of many jobs that require substantial mathematics knowledge and problem-solving skills, the issue of retaining more young people in mathematics has become increasingly important. Many formal and informal initiatives have emerged to address this issue. Some of these target the training of teachers through professional development in order to develop their repertoire of teaching strategies and mathematics content knowledge. These areas have been demonstrated to influence student attitudes towards mathematics as well as student performance. Other initiatives target student motivation and attitudes toward mathematics, suggesting that positive attitudes toward and high self-efficacy in mathematics may lead to increased performance and participation. While some of these initiatives have been created by private organizations, other policy-driven initiatives have emerged as a result of school district and state requirements. For example, in an effort to increase mathematics course taking among high school students, many U.S. states in the 1980s and 1990s increased high school graduation requirements in mathematics. In previous years many states required two years of mathematics to graduate from high school. The National Center for Education Statistics (NCES) has compiled data that showed that by the year 2000 at least 20 states had increased their requirements to three years of mathematics (NCES 2003).

In addition to declining mathematics participation

as students progress through school, great attention has been given to the underperformance in mathematics of specific groups in U.S. society. A major contributor to low mathematics performance is the lower rates of mathematics participation among some groups. Over the years, intervention programs seeking to increase the performance and participation of women and girls and underrepresented people of color (including African Americans, Latino/as, and Native Americans) in mathematics have emerged. For many years, girls and women were discouraged from participating in mathematics. After several decades of outreach programs targeting students and teachers and designed to increase the participation rates of girls and women, the performance gap in mathematics has narrowed substantially. It is nonexistent in early grades, but lingers in a forty-point gap favoring males in SAT mathematics performance. High school mathematics participation rates among males and females are near parity, but there is still a large gap (favoring males) in participation in college and graduate school mathematics.

NCES data show that gaps between the average mathematics performance and participation of Asians, Whites, Blacks, Latino/as, and Native Americans have narrowed over time but still persist. Linda Darling-Hammond and Jeannie Oakes write that structural issues (e.g., differential allocation of resources, teacher shortages, and school poverty) affecting education overall are linked to the participation rates and performance of underrepresented students of color—Blacks, Latino/as, and Native Americans (Darling-Hammond 1995; Oakes 1990). These issues are particularly acute in urban and rural areas, which have difficulty attracting, recruiting, and retaining qualified mathematics teachers. Emerging research from the College Board suggests that underrepresented students of color excel, as do other students, when they receive challenging and interesting mathematics and benefit from high teacher expectations. Thus, similar outreach programs (to those of girls) focusing on affective factors for underrepresented students have been developed and designed to improve mathematics outcomes for these students. Programs designed to improve teacher knowledge and pedagogy also target better mathematics education for underrepresented students of color.

In response to some of these challenges, the

NCTM (2000) has developed six principles (in addition to the standards discussed earlier), which reflect different perspectives (sociological, cultural, mathematical, and psychological) on mathematics education. The six principles (equity, curriculum, teaching, learning, assessment, and technology) were developed to help guide mathematics educators and policymakers' decisionmaking in mathematics education. The major component of the equity principle is that all U.S. students should receive rigorous, high quality mathematics instruction throughout their schooling careers. This is a significant shift from the prevalent beliefs and practices in previous eras that focused on preparing only a small fraction of secondary school students for advanced mathematics and college (Secada 1992; Tate 1997). The curriculum principle underscores the notion that mathematics as a body of knowledge consists of interconnected ideas. Rather than being exposed to mathematics as a set of discrete unrelated topics, students should explore, through focused and deep activities, the links between mathematical ideas (Fennema and Romberg 1999). The teaching and learning principles reflect the ideas that teachers should have high expectations for all students and have opportunities to continue to learn mathematics and ways of teaching it. Students should attain computational fluency as well as conceptual understanding, which require dynamic interaction between teachers and students in the mathematics classroom. Assessment should be ongoing, not just cumulative, and can also be informal as well as formal. Ongoing and informal assessments should guide instruction in the mathematics classroom. Finally, advances in the twenty-first century mean that students must become adept at using technology to solve problems. Throughout the course of their mathematics education, students should have opportunities to use technology to develop their understanding of mathematics and problem-solving skills (NCTM 2000).

All of the challenges and promises of mathematics education in the United States have roots in ongoing debates about what constitutes mathematics teaching and learning. Mathematics education occurs not just in the classroom, but also outside of it; external and internal pressures affect it. Discussions about mathematics education are rooted in sometimes competing and other times overlapping cultural, sociological, psychological, and mathematical perspectives,

and those influence the direction of policy, curriculum, teaching, learning, and assessment. Various constituencies (students, teachers, educators, mathematicians, researchers, administrators, and parents) all have vested interests in how mathematics is taught and learned in schools. Teachers, however, whether they are parents of very young children exposing them to mathematical concepts for the first time, or classroom instructors in the elementary and secondary schools, are probably the most important conduits of mathematics for students. Their education, training, and development have large effects on student learning and performance in mathematics. They are a key component of efforts to build upon the promises of and meet the challenges facing mathematics education in the United States.

Erica N. Walker and Alexander P. Karp

MUSIC EDUCATION THROUGH THE CASE OF BEETHOVEN'S EDUCATIONAL DEVELOPMENT

Ludwig van Beethoven (1770–1827) is one of the greatest musical figures of all time. Yet this fact stands in striking contrast to accounts of his unremarkable performance at school. Indeed, former classmates of his have remarked that not only had he learned virtually nothing in school, but he also exhibited no hint of his later genius. In fact, throughout his life, Beethoven experienced a variety of difficulties in such areas as arithmetic, orthography, and the proper usage of punctuation and capital letters. As late as 1820, Beethoven wrote to music publisher Nikolaus Simrock that he would prefer writing 10,000 musical notes over one letter of the alphabet, a preference arguably borne out in a good number of the letters he wrote throughout his life. One finds in those documents evidence of a gradually declining penmanship and inadequate “intellectual discipline” (Forbes 1967, vol. 1, p. 59). Moreover, though the young Beethoven demonstrated impressive musical skill and talent, his formal education in music was marked by neither a decisive moment, nor by, as Thayer puts it, “any positive evidence that he, like Handel, Haydn,

or Mozart, showed remarkable genius for the art at a very early age”(p. 56). Add to these facts and observations, the multitude of hardships he endured owing to his father’s alcoholism and abusive temperament, his mother’s untimely death (1787), his own bouts with asthma and melancholia, and the early onset of his hearing troubles (1797), which would progress to the point of near-total deafness, and one wonders how his musical genius might be understood. There is, moreover, the question of how his educational development corresponds to his genius in music. Given the many gaps in our knowledge and understanding with respect to the former, how can we know its relevance to the latter? Furthermore, if Beethoven’s competencies are difficult to assess, imagine if he were subjected to current educational assessment exams, particularly of the “standardized” variety. What might one learn from measurements aiming to determine skill and ability without addressing the matter of talent or genius? In this entry these and related questions are considered as they remain important and particularly timely for today’s educators. The focus is biographical and alludes to primary source material drawn largely from Beethoven’s own letters, documents, and conversation books (1991), and from individuals who knew him personally, including, Franz Wegeler and Ferdinand Ries (1987), Anton Schindler (1966), and Gerhard von Breuning (1992). What emerges from our inquiry are otherwise obscure dimensions and details of Beethoven’s personal character and creative approach, dimensions which reveal his rather unique educational development, here necessarily treated from outside the boundaries of the classroom—amidst people and places—and within the interior world of his creative mind. From the standpoint of human development and learning, to consider here Beethoven’s educational limitations and musical genius, both of which he confronted for the sake of his musical art, offers insights and raises important questions for educators. How, for example, does one address the needs of the “exceptional” child, a child who might be exceptional on either end of the learning spectrum? How might educators determine what is necessary for optimal learning in such cases? Is adherence to current student assessment strategies, including standardized testing, beneficial for such individuals? If Beethoven had submitted to such testing, what might his results have indicated

and, perhaps more importantly, what might they have omitted? Finally, how might educators aim to create an optimal learning environment that also takes into account the importance of developing the creative mind? There is no presumption here that such complex and challenging questions are easily answered. They are nevertheless raised in this entry to suggest the need for their consideration by today’s educators, particularly in the arts. Exploring the educational world and genius of the young Beethoven becomes the catalyst in this respect. Indeed, though it may seem that his story is for us remote, perhaps even irrelevant, it contains within it key educational issues that transcend time and place, issues worthy of our careful consideration.

GENERAL EDUCATION

Beethoven was born in Bonn and remained there until his permanent move to Vienna in 1792. The educational system in Bonn was supervised by the Academic Council, established in 1777 by the Elector Maximilian Friedrich. From about six to eleven years of age, Beethoven is believed to have attended the so-called *Tirocinium*, a Latin public school from which a small number of those enrolled would eventually proceed to the gymnasium (high school). According to Thayer, the curriculum there excluded arithmetic and writing (Forbes, ed., 1967, vol. 1, p. 58). However, Wegeler, our only primary source on Beethoven’s upbringing and early education, recalls that the curriculum included not only both of these disciplines, but reading and some Latin as well (Schindler 1966, p. 38). He says, moreover, that Beethoven’s education was “neither particularly neglected nor especially good” (Wegeler and Ries 1987, p. 14).

Beethoven’s public school education did not extend beyond the primary level. As his classmate Wurzer entered the gymnasium in 1781, Thayer speculates that this was the year when, for Beethoven, “all other studies were abandoned in favor of music” (Forbes 1967, vol. 1, p. 58). He explains that the main objective of Beethoven’s father, Johann, was to develop the young Ludwig’s musical genius into a “marketable commodity.” Thus, after age eleven, Beethoven’s formal education was entirely devoted to music. At the same time, he had to contend with an increasingly difficult home life. According to

Wegeler, Johann was a man of “no moral or spiritual strength” (Schindler 1966, 38), using his meager earnings to support both his family and his alcohol addiction. Paul Bekker wrote that he had “no sense of responsibility for his children’s education and welfare” (Bekker 1925, 4). Though earlier on it appears that Johann earned a reasonable living for his family, it was the young Ludwig who would have to provide any semblance of stability within the family. This would ultimately include earning money as well. To accomplish this, he would give regular piano lessons to the Breuning’s youngest son Lorenz (Lenz) and daughter Eleonore (Lorchen). Gradually, Beethoven would be treated as one of the Breuning children, of which there were four: Lorenz and two other sons, and Eleonore, who would become Wegeler’s wife. Ultimately, Beethoven would gain far more than recompense for piano lessons from the Breuning family. He found in Frau Helene von Breuning, a cultured twenty-eight-year-old widow of Court Councillor Emanuel Josef von Breuning, something of a mother figure, influencing both his social and educational development. It was with the Breunings, therefore, that Beethoven is said to have begun “his first serious artistic studies” (Bekker 1925, 10–11). Moreover, Beethoven’s social ties with them and their well-educated and cultured circle of friends and acquaintances doubtless mitigated against much of his family crises of finances, alcoholism, sickness, and death.

One frequent guest at the Breuning’s was Baron Ignaz de Cler, governor of the city. Stephan von Breuning’s son Gerhard describes him as a kind of “word-of-mouth newspaper,” reporting on news of the city (Breuning 1992, 21). Gerhard speaks also of two influential family members: his grandfather’s brother, Johann Lorenz von Breuning and a brother-in-law, Johann Philipp von Breuning. The former was a canon in Neuss who moved to Bonn to take charge of educating his brother’s four young children and to manage the family’s affairs. He remained there until his death (1796). The latter, Johann Philipp von Breuning, who was born in Mergentheim (1742), became first a priest (1769) and soon thereafter a canon, moving to Kerpen, where he remained until his death (1832). Gerhard describes him as “very clever and extremely kind” (p. 25). Family and friends, including Beethoven, enjoyed visits to his home in summer. Beethoven

would also play organ at the church there. Of their school years in general Gerhard would say that they were passed “amid the affection of uncles, aunts, and others” (p. 25).

Wegeler was a regular guest of the Breuning’s. Beethoven doubtless identified closely with him, particularly as his family, too, had financial hardships. Wegeler’s response to his circumstances was to focus on his education. This served him well as he was to eventually become a medical doctor. His character has been described by Gerhard as “charming and ambitious” (Breuning 1992, 25).

Education at the Breuning’s is said to have included a “thorough study of science and art” (Breuning 1992, 29). According to Wegeler, Beethoven “felt free” there, adding that “everything combined to make him cheerful and to develop his mind” (Wegeler and Ries 1987, 16). Thus his musicianship and his general education would continue to advance. With respect to the latter, it appears that he was exposed to the Greek and Roman classics, and the philosophies of Rousseau, Voltaire, Kant, and Hegel. Moreover, he enjoyed reading German literature and poetry, and exploring contemporary issues, including the French Revolution and related revolutionary initiatives. This exposure enabled him to close some of his educational gaps and to develop intellectually. Gerhard would say, moreover, that, despite the number of “gifted” and “ambitious” young people at grandmother Breuning’s house, it was Beethoven who remained the “center of animated interest . . . whose improvisations roamed over the piano of the house half the night through” (Breuning 1992, 29). As pianist and teacher of the piano at homes of the nobility, including the Breuning’s, Beethoven had acquired friends and patrons appreciative and supportive of his musicianship and future promise.

MUSICAL EDUCATION IN BONN

Obvious gaps in Beethoven’s general education are attributed to the brevity of his formal education and to the highly probable speculation that his out-of-school hours were largely devoted to music (Kerman and Tyson 2001, vol. 3, p. 73). The early years of Beethoven’s musical training on both piano and violin took place at home under the stern supervision of his father Johann, himself a court musician since the age of twelve—first as a treble, later alto, and, finally, as a

tenor. Johann served under Maximilian Friedrich, elector archbishop of Cologne, who resided at Bonn. He was not the first in the family to serve the electoral court. In fact, his own father, the Dutchman Ludvig van Biethofen (1712–1773), had the more distinguished musical career, joining the court in 1733 under Clement Augustus, elector archbishop of Cologne. He was first a singer there and then, in 1761, kapellmeister. Prior to his arrival in Bonn, he served as composer, singer, military bandleader, and organist at the Church of St. Jacques in Antwerp. We learn from Wegeler that, though Ludvig died early in his grandson's life, he was nevertheless an enduring source of inspiration for the young Ludwig (Wegeler and Ries 1987, 13). Beethoven is said to have enjoyed speaking with friends about his grandfather and to have often requested of his mother that she recount stories about him. He is also said to have bore little resemblance to either parent, instead resembling, "in his talent, habits and all of his mental traits, . . . this sturdy Dutchman" (Hubbard 1901, 37). It is interesting that Beethoven chose to have sent only one item from Bonn to Vienna: a portrait of his grandfather by Radoux, an artist at court.

Ultimately the court was served by three generations of Beethovens. Johann, in preparation for his son's eventual service there, would drag the reticent and tearful Ludwig to the piano for lessons and practice (Schindler 1966, 38). Beethoven's disinclination for both piano and violin playing did nothing to prevent his first public concert in Cologne on March 26, 1778, the announcement listing "various clavier concertos and trios" (Kerman and Tyson 2001, vol. 3, p. 73). This is the only known occasion upon which Johann presented his son as a prodigy. In fact, Beethoven had not exhibited the kind of "wunderkind" genius of Mozart. His musicianship had nevertheless developed to the degree that, by his ninth year, he had surpassed his father's musical competencies. Aware of this fact, Johann would pass his son's musical education to colleagues at court and to local and visiting musicians.

First among the more advanced musicians to instruct Beethoven was Tobias Friedrich Pfeiffer, who, for a time, lived with the Beethovens. A member of the Grossman Theater, Pfeiffer was a proficient tenor, pianist, oboist, and conductor. He is said to have kept a busy but rather informal schedule, particularly owing to frequent late-night visits—often in the

company of Beethoven's father—to the local tavern. Thus the young Beethoven had no regularly scheduled lessons. Instead, Johann and Pfeiffer would interrupt the boy's sleep for all-night lessons. Ludwig's mother appears for a time to have remained largely silent on the matter. Pfeiffer's lessons nonetheless appear to have been of substantial benefit to Beethoven. According to Wegeler, Beethoven "owed much to this teacher and was so grateful to him that even after he had gone to Vienna, he continued to make Simrock give him regular sums of money" (Schindler 1966, 39). A relative of Beethoven's, Franz Rovantini, would give him lessons on violin and viola. Rovantini, Pfeiffer and Beethoven, would regularly fill the house with ensemble playing upon flute, violin, and piano, respectively.

Johann arranged for his son's more informal music lessons with a number of local organists including Willibald Koch of the Franciscan Fathers, Hanzmann of the Minorite order, and Zensen of the minster (Wyn Jones 1998, 5). Beethoven's true mastery of the techniques of organ playing, however, was owing to Aegidius van den Eeden, organist at the Electoral court. Johann is said to have likewise arranged for these lessons, which included figured bass. Beethoven would later acknowledge their value for organists and pianists.

German composer, organist, and conductor Christian Gottlob Neefe (1748–1798) is said to be Beethoven's first important teacher, this despite Wegeler's claim that he had "little if any influence on the musical instruction of young Ludwig" (Schindler 1966, 39). Neefe settled in Bonn in 1779 to join the Grossman Theater and, in 1781, he succeeded van den Eeden as court organist at the electoral chapel. Shortly thereafter, Beethoven began training as his assistant. In 1782, during Neefe's brief departure from Bonn in 1782, the eleven-year-old Beethoven was left in full charge. Later that year, Beethoven assumed Neefe's position as cembalist during stage rehearsals. This involved directing the orchestra and sight-reading at the keyboard. By 1784, Beethoven secured the position of assistant organist. Thus, in contrast to what can only be surmised about Beethoven's approach to his earlier, formal education at school, in his musical studies he was lacking neither diligence nor ability. Moreover, he would continue to gain public recognition owing to Neefe's support in publishing his early works, including the

Dressler Variations and three *Kurfürsten* sonatas for piano. Neefe also praised Beethoven's musical talents in Cramer's *Magazin der Musik* (1783). From this public pronouncement one learns of Beethoven's impressive skills at the keyboard and in sight reading, his ability in thorough bass, his promise in music composition, and that, by thirteen years of age, he had apparently learned and largely mastered four instruments including the clavier, organ, violin, and viola. Moreover, and perhaps most importantly in terms of his developing musicianship, one learns that Neefe had introduced him to the music of Johann Sebastian Bach. For this, Lockwood would say of Neefe that he "earned his place in history." Count Ferdinand Ernst Waldstein is yet another individual of the Bonn years who would prove immeasurably beneficial to Beethoven's early career. A wealthy nobleman and himself a practicing musician, the count was to be Beethoven's first and most significant patron. According to Wegeler, Waldstein supported Beethoven "in every possible way," adding that he was "the first to fully appreciate his genius" (Wegeler and Ries 1987, 19). Wegeler also credits Waldstein with Beethoven having been sent by the Elector to Vienna and with his developing ability to improvise variations on a given theme. That Beethoven had dedicated to Waldstein his *Sonata in C Major, Opus 53*, was, for Wegeler, "proof" of his "undiminished gratitude" (p. 20).

When in 1792 Beethoven left Bonn permanently to reside in Vienna, he carried in his pocket a letter of encouragement from the count. The letter's closing line reads, "With the help of assiduous labor you shall receive Mozart's spirit from Haydn's hands" (Latham 1972, 4). As Wegeler would say, Count Waldstein was "the man Beethoven had to thank that the first blossoming of his genius was not suppressed" (Wegeler and Ries 1987, 20).

BROADER EDUCATIONAL INFLUENCES

With exposure to individuals such as the Breunings, Count Waldstein, and Neefe, among others, Beethoven's education was certain to exceed musical parameters. Neefe's own studies were in jurisprudence at the university in Leipzig. Moreover, he was himself interested in aesthetics, intellectual affairs, and contemporary literature. While at Leipzig,

he is said to have contacted the poets Christian Fürchtegott Gellert and Johann Christoph Gottsched, and to have introduced Beethoven to the new German literary movement, *Sturm und Drang* ("storm and stress"), with its more romantic aesthetic (Lockwood 2003, 32). Neefe was exposed to a rich cultural and artistic society that included "the musician Johann Adam Hiller, the philosopher Johann Jakob Engel, the engraver Johann Friedrich Bause, and the painter Adam Friedrich Oeser" (Wyn Jones 1998, 7). Neefe's success as a composer of German opera was cultivated by Hiller, his teacher. As an educated and widely acclaimed musician, Neefe, a Protestant, might have settled, as Wyn Jones suggests, in Leipzig or Hamburg. He nevertheless remained in Bonn, teaching keyboard instruments and music theory to the young Ludwig among others.

As a member of the *Illuminati* sect of Freemasons, Neefe supported French revolutionary ideals. In 1787, after this sect was largely suppressed, he would join Bonn's *Lesegesellschaft*, a reading society. Beethoven benefited from his teacher's affiliation with this group, receiving commissions to compose two cantatas: the first (WoO 87), on the death of Joseph II, and the second (WoO 88), for the elevation of Leopold II.

Beyond individuals such as Neefe and Waldstein, Beethoven would be influenced intellectually, politically, and artistically by the broader social environment of Bonn itself. At the very least, one may speak of its "indirect influence" on such compositions of his as *Fidelio*, *Egmont*, and the *Ninth Symphony* (Coldicott 1991, 60). Leonard Meyer is cited for having a similarly broad view on studies of musical influence, studies in which there can be a tendency to "depict the issue of influence as purely musicological" (DeNora 1995, 5). This, in turn, would "side-step the issue of social circumstance." In Lewis Mumford's view, the city itself can become "the chief instrument of education," the "wider school of the young and the university of the adult" (Mumford 1938, 474). As for the Bonn of Beethoven's youth, it was rather cosmopolitan, particularly owing to a rich musical life at court. There were, for example, regularly scheduled performances of Italian comic opera, French *opéra-comiques*, and German opera and *Singspiel*. Theatre performances alternated between court in the winter months and elsewhere in the sum-

mer. Aristocrats and court officials sought music lessons from individuals such as Ludwig's father, Johann. Such lessons would eventually pass to his son and would, in their way, enhance his own intellectual and artistic development.

Bonn's political, cultural, and intellectual affairs were to come under Vienna's influence once Maximilian Franz became elector in 1784. It has been said that, not unlike his brother the emperor, he encouraged much of the cultural and intellectual life in Bonn. His personal library, which contained a rather diverse and impressive collection of texts, underscores his interest in and dedication to this initiative.

After his permanent move to Vienna, Beethoven maintained a connection with Bonn by writing letters to the various friends and acquaintances he had made there, including Simrock and Wegeler, among others. In a letter to Wegeler (1801), he declares that the day they meet again and greet "Father Rhine" will be "one of the happiest" of his life. As that day was not to be realized, memories and letter writing would be his only link to Bonn, the place of his earliest development and achievement in music.

EARLY YEARS IN VIENNA

Little is known of Beethoven's first visit to Vienna. He arrived there in early April of 1787 to study with Mozart. Due to his mother's failing health, however, he departed shortly thereafter for Bonn. A nineteenth-century anecdote leaves Mozart less than enthusiastic about Beethoven's piano playing, though he was impressed by his improvisational skills, for which he is quoted as saying, "Mark that man; he will make himself a name in the world" (Wyn Jones 1998, 17). Indeed, at this stage in Beethoven's developing musicianship, he had not made a mark comparable to that of either Haydn or Mozart. Music scholar Wyn Jones describes the development of Beethoven's musicianship during the remaining five years in Bonn as "quiet, though steady" (p. 19).

Shortly after Beethoven's permanent move to Vienna in December 1792, he began lessons with Haydn, who assigned to him Fux's *Gradus ad Parnassum*, a standard counterpoint text, first published in 1725. Mozart, too, was skilled in this approach to contrapuntal writing. As has been observed, this approach, with its emphasis upon the melodic, provided a good "balance" for Beethoven, whose

musical competencies at the keyboard and with figured bass tended to emphasize the harmonic. Even so, studies in Vienna with Haydn had not lessened Beethoven's appreciation for his more formative years of study in Bonn under Neeffe. In 1793 Beethoven tells Neeffe in a letter that he will have a share in his success should he become famous.

Prince Lichnowsky (1756–1814) was the first among many patrons Beethoven would have in Vienna. He subsidized the publication of Beethoven's three Trios op. 1. These trios were accordingly dedicated to the prince, as were the Piano Sonatas opp. 13 and 26, the Second Symphony, and a set of variations (WoO 69). From about 1793 to 1795, Beethoven lived at Lichnowsky's home, where many of his new works received their premiere during weekly concerts. Other patrons included Prince Franz Joseph Lobkowitz, Count Johann Georg Browne, Count Andreas Rasumovsky, Prince Ferdinand Johann Kinsky, the Countess Anna Maria Erdödy, and the Archduke Johann Joseph Rudolph.

Beethoven's extramusical passion for literature would become increasingly evident. Karl-Heinz Köhler observes that, within the surviving conversation books, Beethoven had taken note of 178 titles from the daily press. Some of these books, such as those dedicated to language or religion, would serve to further his general education. Others are said by Köhler to offer more general insights on the "practical exigencies of life, illness, and household organization." In addition to those that focused on musical development, there were texts on philosophy and the natural sciences, including the then fashionable subject of astronomy. Finally, he was drawn to notable works of world literature, especially those of Shakespeare, Goethe, and Schiller (Köhler 1980, 157).

The titles cited within these conversation books provide a measure of insight into Beethoven's interests and thinking, as do the underlined passages in some of the surviving poetry and prose books from his personal library. One finds in these examples an affirmed interest in ethical and social subjects, as well as subjects involving humanity, nature, and love. Such works were of more than passing interest to Beethoven. They inspired him to incorporate into his own life much of the contents within them. Thus one must count authors living

and long since deceased to be among Beethoven's important educational influences. Beethoven, in a letter to Wegeler (1801), says "Plutarch has shown me the path of resignation." This is in the context of informing Wegeler of his various health problems, not the least of which was his gradually worsening hearing condition. Perhaps it was indeed his exposure to Plutarch's writings that sustained him in the face of impending, total deafness.

In 1802, under medical advice, Beethoven took a six-month leave to Heiligenstadt, a small, quiet village outside Vienna. After a time there, he would realize the permanence, and ever-deteriorating condition, of his hearing. Many an author has been compelled to quote in full his most famous document, the so-called Heiligenstadt Testament, written October 6, 1802. Addressed to his brothers and, clearly enough, for posterity, the testament reflects Beethoven's inner turmoil over the likelihood of becoming completely deaf, if not terminally ill. For its immeasurable value in imparting something of Beethoven's interior world, it is quoted here in full:

For my brothers Carl and [Johann] Beethoven,

O you my fellow-men, who take me or denounce me for morose, crabbed, or misanthropical, how you do me wrong! you know not the secret cause of what seems thus to you. My heart and my disposition were from childhood up inclined to the tender feeling of goodwill, I was always minded to perform even great actions; but only consider that for six years past I have fallen into an incurable condition, aggravated by senseless physicians, year after year deceived in the hope of recovery, and in the end compelled to contemplate a lasting malady, the cure of which may take years or even prove impossible. Born with a fiery lively temperament, inclined even for the amusements of society, I was early forced to isolate myself, to lead a solitary life. If now and again I tried for once to give the go-by to all of this, O how rudely was I repulsed by the redoubled mournful experience of my defective hearing; but not yet could I bring myself to say to people 'Speak louder, shout, for I am deaf.' O how should I then bring myself to admit the weakness of a sense which I once possessed in the greatest perfection, a perfection such as few assuredly of my profession have yet pos-

sessed it in—O I cannot do it! forgive me then, if you see me shrink away when I would fain mingle among you. Double pain does my misfortune give me, in making me misunderstood. Recreation in human society, the more delicate passages of conversation, confidential outpourings, none of these are for me; all alone, almost only so much as the sheerest necessity demands can I bring myself to venture into society; I must live like an exile; if I venture into company a burning dread falls on me, the dreadful risk of letting my condition be perceived. So it was these last six months which I passed in the country, being ordered by my sensible physician to spare my hearing as much as possible. He fell in with what has now become almost my natural disposition, though sometimes, carried away by the craving for society, I let myself be misled into it; but what humiliation when someone stood by me and heard a flute in the distance, and I heard nothing, or when someone heard the herd-boy singing, and I again heard nothing. Such occurrences brought me nigh to despair, a little more and I had put an end to my own life—only it, my art, held me back. O it seemed to me impossible to quit the world until I had produced all I felt it in me to produce; and so I reprieved this wretched life—truly wretched, a body so sensitive that a change of any rapidity may alter my state from very good to very bad. Patience—that's the word, she it is I must take for my guide; I have done so—lasting I hope shall be my resolve to endure, till it please the inexorable Parcae to sever the thread. It may be things will go better, may be not; I am prepared—already in my twenty-eighth year forced—to turn philosopher: it is not easy, for an artist harder than for anyone. O God, Thou seest into my inward part, Thou art acquainted with it, Thou knowest that love to man and the inclination to beneficence dwell therein. O my fellow-men, when hereafter you read this, think that you have done me wrong; and the unfortunate, let him console himself by finding a companion in misfortune, who, despite all natural obstacles, has yet done everything in his power to take rank amongst good artists and good men.—You, my brothers Carl and . . . , as soon as I am dead, if Professor Schmidt is still alive, beg him in my name to describe my illness, and append this present document to his account in order that the

world may at least as far as possible be reconciled with me after my death.—At the same time I appoint you both heirs to my little fortune (if so it may be styled); divide it fairly, and agree and help one another; what you have done against me has been, you well know, long since forgiven. You, brother Carl, I especially thank for the attachment you have shown me in this latter time. My wish is that you may have a better life with fewer cares than I have had; exhort your children to virtue, that alone can give happiness—not money, I speak from experience; that it was which upheld me even in misery, to that and to my art my thanks are due, that I did not end my life by suicide.—Farewell, and love each other. I send thanks to all my friends, especially Prince Lichnowski and Professor Schmidt. I want Prince L's instruments to remain in the safe keeping of one of you, but don't let there be any strife between you about it; only whenever they can help you to something more useful, sell them by all means. How glad am I if even under the sod I can be of use to you—so may it prove! With joy I hasten to meet death face to face. If he come before I have had opportunity to unfold all my artistic capabilities, he will, despite my hard fate, yet come too soon, and I no doubt should wish him later; but even then I am content; does he not free me from a state of ceaseless suffering? Come when thou wilt, I shall face thee with courage. Farewell, and do not quite forget me in death, I have deserved it of you, who in my life had often thought for you, for your happiness; may it be yours!

Ludwig van Beethoven
(Grove 1896)

Despite its anguished tones, one finds in this document a resignation from which emerges an inner strength that would sustain him for the sake of his musical art. Perhaps Plutarch had indeed become the driving force behind his will to survive and to create. He had intimated as much in a letter to Wegeler just months prior to the writing of the Testament. Perhaps it was Beethoven's own difficult past that had served as preparation for the burdens he was now facing. The example of his friend Wegeler, whose determination enabled him to rise above family poverty to become a physician, might have played a role,

as had the inspired memory of the Breuning family and their social circle. Napoleon's heroic image was doubtless another source of inspiration, though this was short-lived as the hero would declare himself emperor. Though all of these are doubtless to be counted among the factors that motivated Beethoven, the most important factor was, as is indicated in the Testament itself, his art.

DETERMINING SUCCESSES IN THE ARTS

Beethoven is among the greatest musical figures of all time. Yet how does one know this? Can one assess in precise terms the value of Beethoven's musical contributions to the world, and, if this were possible, could there be consensus over the outcome or, moreover, the validity of such a determination? Indeed, evaluating successes in the arts can be especially problematic. On the evolution of Western art, Jacques Maritain, in his *Creative Intuition in Art and Poetry*, says that "the sense of the human Self and of human subjectivity enters a process of internalization, and passes from the *object* depicted to the *mode* with which the artist performs his work. Then occurs the outburst of individualism commonly pointed out apropos of the Renaissance, baroque art, and . . . classical art" (Maritain 1953, 23).

In fact, individualism in the arts, particularly since the sixteenth century, is responsible for the emergence of a variety of divergent schools. As the subjective in art is the single greatest factor in a creative work's originality, it alone can often determine a work's success or failure. Yet how does one address the inherent difficulties associated with its assessment, difficulties all the more pressing given that, on some level, its influence is always a key factor? While the subjective in art appears perhaps more relevant in the context of recent history, Maynard Solomon places in historical perspective the fact that an artist's "individual stamp" has always been observable (Solomon 1988, 102). Even so, however apparent an artwork's originality may appear to be, its wholesale appreciation necessarily remains fundamentally elusive to the outside observer, including those skilled and talented artists who attempt to assess each other's work. According to Maritain, "the individual factor in the mode of performing the work becomes so powerful that the greatest artists cannot actually understand each other's art" (Maritain

1953, 25). He goes on to say that “Michelangelo was singularly hard on Flemish painting, ‘which attempts to do so many things that it does none well,’ and El Greco said that Michelangelo ‘was a good man but did not know how to paint’” (p. 25).

Tensions between Haydn and his pupil Beethoven likewise arose from what Lockwood describes as “innate artistic differences” (Lockwood 2003, 85). Haydn’s “corrections” of Beethoven’s “errors” in species counterpoint exercises, for example, appear to have had little influence upon the latter’s musical style. In fact, on Beethoven’s work in counterpoint, Cooper says, “in some cases what was technically a ‘mistake’ in strict counterpoint (for example, sounding a suspension simultaneously with its resolution) became a characteristic feature of his style” (Cooper 1991, 78–79).

Beethoven also found Haydn’s word-painting in *The Creation* and in *The Seasons* to be somewhat superficial, and would later tell his pupil Ferdinand Ries that, from studies with Haydn, he “never learned anything.” Moreover, he refused Haydn’s wishes to have the words “pupil of Haydn” on the title page of his published works of the day (Cooper 1991, 79). Ries nevertheless recalls that Beethoven had indeed recognized “Haydn’s greater achievements, especially the many choral works and certain other things for which he properly lavished praise on Haydn” (Wegeler and Ries 1987, 68).

Thus we find instances in music where the subjective dimension in art can become an inadvertent force against peer appreciation. In the case of Haydn and Beethoven, the harsh or misinformed judgments each made of the other’s music is perhaps best understood from this standpoint. From DeNora’s perspective:

it would be unfair . . . to accuse Beethoven’s contemporary opponents of philistinism or musical ignorance or to argue that opposition to Beethoven consisted simply of conservative reactions. Equally unfair is attributing the failure of some of Beethoven’s contemporaries to appreciate his work to ‘psychological inhibitions.’ Similarly, it is fallacious to argue that the artistic steps Beethoven took were those of a giant, and that if his contemporaries were unable to perceive their inherent value it was because they were too small or lacked vision. To account for Beethoven’s talent in any of these ways is to hold a view that flatters the present-day viewer’s so-called more advanced

perspective; it also imposes our own aesthetic evaluative terms on a group for which they are not necessarily appropriate (DeNora 1995, 5).

That the “present-day viewer” may have neither the “more advanced perspective” nor the more informed aesthetic sensibilities underscores the imprecision associated with assessing musicianship and, in the case of Beethoven, genius. Moreover, though test taking may be important for certain prescribed purposes pertaining to the measurement of particular student strengths and weaknesses, current emphases upon educational assessment and its outcomes necessarily raises important questions, one of them being: Can emphases upon such measurements have precisely the opposite effect upon students from that which is intended, becoming, rather, a deterrent to learning? Put another way, can excessive test taking, and the stress that might be associated with it, compromise one’s desire to learn? One must consider why students are expected to attend class in the first place. Is it so that they can learn or be tested? Of course, an educator can ignore this either/or question with an appropriate balance between the two. However, with ever-increasing external mandates for testing, this becomes a growing difficulty. If educators are indeed compelled to place too great an emphasis upon the supposed outcomes of such tests, they might ignore the fact that there are limitations inherent in their standardization and preconception. As such tests are designed to measure specific and limited areas within preconceived academic parameters, they are of course wholly inadequate for gaining a more comprehensive appreciation of an individual’s abilities, particularly as they might pertain to artistic originality, talents, and, as in the case of Beethoven, emerging musical genius. The question of imposing a minimum standard for a given test likewise has implications potentially detrimental to human development and learning. Indeed, what do such measures predict in the real world, and if they are not intended to predict, what is their benefit? It seems certain, for example, that had Beethoven submitted to modern-day, standardized assessment tests in writing and arithmetic, he would have likely failed to demonstrate any measure of competency, to say nothing of proficiency. Moreover, it is likely that he would have learned what he himself and others already knew: that he was particularly deficient

in writing and arithmetic. Perhaps more importantly, from such test results, one could not anticipate much that would ultimately distinguish Beethoven in music. Indeed, statistical data based upon measurable, objectified standards leaves little room for ambiguity and thus would have been marginally informative if not irrelevant in such a case. Though Beethoven might well have benefited from being tested and receiving specialized training for his particular deficiencies, he might have paid a price for it. This is because such tests might have brought about excessive external pressures to succeed. Moreover, if a student receives poor test results, this can have a marginalizing or exclusionary effect. Perhaps one might conclude that Beethoven was fortunate to have had—with the exception of his early musical training—the opportunity to learn in his own way and at his own pace. Indeed, it was after the very strict and difficult music lessons of his boyhood, when he was assuming more responsibility for the family, that he would begin to flourish. Ultimately, it may be said that Beethoven's educational development, despite its inconsistencies, was impressive. In addition to realizing his genius in music, a genius he would share with the world, he had learned something about himself through the world around him and something about the world through having developed an appreciation for his place in it. This was a lifelong journey in large measure developed through his social interactions and intellectual interests in the classics and more contemporary literary, poetic, and philosophic works. Beethoven's musical and educational competencies were to be determined, of course, by means other than that of standardized testing and the like. Indeed, they were to be determined by those who had a share in his development of these competencies. These included friends, teachers, and patrons, all of whom assessed his musicianship in qualitative terms, drawing from their own educational backgrounds and experiences and from their knowledge of, and interactions with, Beethoven himself. Though Beethoven's father might have found better approaches to educating his son, for example, he knew enough about his own limitations on the one hand and his son's musical competencies on the other to recommend to him more advanced musicians for his training. Beethoven's grandfather, while little is known of him and less still of his relationship with his grandson, is yet another individual that must have somehow sensed a musical

potential in the very young boy, imparting perhaps much that would remain an inspiration for him.

CONCLUSION

The inherently complex, unpredictable, and exceptional nature of genius renders it inexplicable in solely educational, societal, or broader cultural and environmental terms. This perhaps explains in part the number of times Beethoven is said to have gained nothing from his various teachers. Recall that a former classmate had claimed Beethoven learned “absolutely nothing” in school and that, according to Wegeler, Neefe had “little if any influence on the musical instruction of young Ludwig.” Beethoven himself said he “never learned anything” from Haydn. Of course Beethoven had learned much from his various teachers and he was at least as grateful to them as he was to his friends and patrons the Breunings, Count Waldstein, and Prince Lichnowsky, among others—even if there were temporary ruptures of personal friendship. That Beethoven had learned a great deal from others along the way does not negate the fact that his music is uniquely his own. As with any great artist, Beethoven fully absorbed and assimilated his musical influences to develop and express his own musical voice, even if echoes of his musical thunder have their origins in Haydn and Mozart.

Despite Beethoven's lifelong difficulties in spelling and arithmetic—his nephew Karl attempting in vain yet again to impart to him multiplication operations, this time as he lay on his deathbed—and despite the fact that he was not the child prodigy that Mozart had been, his rare genius was to find masterful expression in music as he overcame, in an almost superhuman way, a particularly difficult set of life's hardships and challenges. Though the case of Beethoven's educational development is perhaps at the far end of a spectrum, educators in the arts might gain important insights from taking a closer look. Indeed, the art individuals create may be regarded as an important part of culture, both informing it and being informed by it. Thus the question of how one might stimulate and nurture the creative mind becomes important as well, as does that of the relationship between self and culture. Each informs the other in a process of shaping and being shaped, of being independent and interdepen-

dent. The question of how educators in the arts might focus upon ways to support the creative mind thus deserves our thoughtful consideration as art is not separate from culture and therefore neither is it separate from education.

Linda Ardito

SCIENCE EDUCATION

The struggles that are experienced today regarding the focus that should be taken in science classrooms resonate back through the history of American schooling. Since its first broad introduction into school curriculum, at the urging of scientists and the National Education Association in the late nineteenth century, what focus science education should take has been a subject of almost continuous debate with resultant swings in focus, approach, and intent over that time. These changes and debates about science education, the goals of science education, and preferred teaching methods have occurred as a result of changing political, economic, and social influences and pressure. In many countries, including the United States, science education has come to be seen as a way to counter problems such as a decline in international competitiveness, (perceived) weakness in military power, and increasing unemployment. Apart from these purposes, the necessity for science literacy has also been promoted from the perspective that it was a necessity so that individuals could best discharge their civic responsibilities (such as when voting) and for reasons of personal empowerment (through learning about concepts and practices which can influence their day-to-day decisions and activities).

Understandings of just what “science literacy” is have swung between various positions over the last century. At various times there has been a focus on the importance of understanding theories, claims, and hypotheses and how these came to be (essentially a “history” of science knowledge); at other times there has been a focus on the importance of students understanding and being able to replicate the practices of scientists (acting, in various ways, as little scientists themselves). Aligned with this shifting perspective is a swing between “teacher-centered” lessons

(where teachers guide all of the activities in the classroom; usually “cookbook” laboratory activities and lectures) and student-centered activities (in which students guide the questions and talk themselves through concepts and share with other students their emerging understandings).

Early in the twentieth century the role of science education was seen to be one of providing personal empowerment (as argued both by John Dewey and the National Education Association Committee of Ten as far back as 1893). Generally, children in biology learned about names of organisms, how they were classified, and what the parts of organisms were, as well as dealing with anatomy, physiology, health, hygiene, and sex education. Overall, biology (or “Nature Study”) dealt with what were considered important practical issues. This also explains why it was occasionally approached in various parts of the United States as agricultural science, particularly during the dust storms and droughts of the 1930s when students learned about soil erosion by wind and water, and how to avoid or lessen the effects of erosion with crop rotation and the planting of trees. In the other science subjects, however, physics and chemistry students concentrated on memorizing current theories and abstract models central to those disciplines and the curriculum in those subjects was often less concerned with practical (i.e., everyday) issues. During this time period pressure increased on textbook writers (who were the primary developers of curriculum) to make physics and chemistry curricula more relevant, practical, and applied. Overall, enrollment in chemistry and physics was often low (between 7 percent and 19 percent of students) with biology being a more popular subject. In part, this pressure explains the change through the 1940s and 1950s toward science curricula that were more focused on scientific processes and discovery, and less so on just knowledge and facts. The commercialization of science education also progressed through this time as more and more “lab kits” became available and more and more children learned science through the use of these kits. Although during this time many ideas were presented for improving science education, little actual headway was made and the same confusion about how to teach science which was present at the beginning of that century continued to prevail in the middle. The Second World War had, however, made it clear that those students who

were well versed in science, mathematics, and technology were key to developing a strong military and manufacturing base. With the shortages in personnel in these areas that became apparent after the war, science education gained increasing prominence in the postwar years.

The launching of Sputnik (the Russian man-in-space vessel) on October 4, 1957, is one example of an event that resulted in considerable change in science education. This launch by the Russians was taken as an indicator of the decrease of American innovation and creativity in relation to other nations and a decline in overall national competency in the sciences. Sputnik caused a resurgence of interest in science education as teaching science effectively was seen as a way to deal with a changing economy (which was becoming more technologically based) by improving the labor pool, improving recruitment to science careers, and winning the space race.

Despite the development of new curricula, often by scientists themselves, field testing of it was problematic. Whereas there was an increased interest in engaging students in laboratory activities or experiments in this curricula, teachers all too often integrated the laboratory activity into a lecture rather than performing the activity itself. Thus, despite the intentions of those who drafted the curriculum for students to engage in laboratory activities, students instead took turns reading from science textbooks and did not have the opportunity to experience science as a direct phenomenon.

The 1960s were characterized by tremendous progress in science and technology innovations, particularly with respect to products that impacted on the day-to-day lives of most people. New products in kitchens and households promising ease of use and improvement in everyday life were released and fired the imaginations of young people towards careers in science. "Better living through chemistry" became a catchphrase of the times, and television shows such as *Star Trek* presented science and the promises it held for the future as an exciting endeavor and therefore an interesting career for students to consider. Science curricula, through the efforts of scientists involved in their writing, evolved in the 1960s to a more demanding treatment of the subjects with few connections to the daily experiences of students or applications of the concepts. They instead dealt primarily with mechanical practices (such as calculations) deeply embedded with subject theory and models. Pedagogical approaches in-

cluded the incorporation of confirmatory laboratory activities (or "cookbook" labs) in which students engaged in experiments which confirmed the theories and models. Focused primarily on attracting the very brightest of students, science literacy was now considered to be important mostly for those high school students who were themselves going to become scientists.

Discussions of trends in science education throughout the 1970s are somewhat mixed. Some sources state that overall scientific literacy began to decline, and this was countered by incorporating more scientific "facts" into textbooks based on the ideological perspective that more content would fix the problem with science literacy. The consequence of this was that learning environments had a strong emphasis on memorization, with the result that student interest in science declined as students again became unable to see any personal relevance or application of science to their lives. Other sources suggest that the 1970s and early 1980s were characterized by an increase in a broader study of science incorporating concepts, processes, and values in a matrix which emphasized the importance of Science, Technology, and Society (STS) and student understanding of the relations between these from both a positive perspective (e.g., improved insulation for instance) and a negative one (such as nuclear waste) for society. These contradictory explanations of trends through the 1970s are perhaps explained by education being a state responsibility with curricula development and textbook choices occurring at the state level, and therefore approaches taken in one part of the country may well have been dissimilar to those used in other parts.

CONTEMPORARY ISSUES IN SCIENCE EDUCATION

In the early 1980s various reports called for a continued adoption of science curricula which focused on students' individual needs and on improved understanding of the STS issues mentioned earlier so that they could make better decisions about science-related social issues. However, as a consequence of the 1983 report *A Nation at Risk: The Imperative for Educational Reform* (National Commission on Excellence in Education), which reported that American high school graduates and citizens had only a minimal understanding of science (as indicated by international test scores), standards were raised and a new era of

accountability began. There is, however, little evidence that this effort has led to improved science literacy in the United States despite considerable funds and efforts (both in research and in pedagogical changes).

As the 1980s progressed into the 1990s a perspective on learning called “constructivism” was adopted by many science education researchers and was integrated with the concept of “authenticity” into their education of science teachers. Although there are many variants on constructivism, at its simplest it means that individuals construct meaning by integrating new experiences and understandings of concepts into past experiences and previous understandings of concepts. This view is in opposition to the *Tabula Rasa* (or “blank slate”) model, implicit in approaches to learning in the preceding decades, which suggested that students could essentially have new ideas (such as science concepts or practices) transferred into their heads and retain the knowledge distinct from any other experiences without these prior experiences influencing the student understanding of the transferred concept. In essence, constructivism brought to the fore the idea that prior individual experiences and context were important factors to consider when trying to develop classroom environments from which students could learn science content and practices. The idea of authenticity in science classes builds on this idea of constructivism and the importance of experiential context, as does the considerable number of insights into the practices of scientists themselves as documented in a disciplinary area known as sociology of science. From this perspective of authenticity, students’ understanding of science concepts will best occur if they have engaged in science classroom practices which mirror those engaged in by scientists themselves when understandings of those concepts developed. Thus, the idea that students would best learn about science concepts by participating in self-directed, open-inquiry (meaning that the outcomes were [potentially] unknown) activities began to be promoted in faculties of education and in textbooks on science education. Over the past decade ideas of authenticity have changed from experiencing the local practices of scientists (i.e., individual investigations), to an understanding that the long-term nature of their activities and distributed nature of their community practices are also relevant to the learning. Thus, current science education practices are beginning to promote

the idea that students will best develop understanding of science concepts by participating in long-term, community-based activities where students participate both in networks of students as well as networks of other individuals with interests in the activities. One outcome from this approach to having students learn science is that they learn that science knowledge is dynamic and evolves and changes over time, as opposed to learning outcomes from traditional approaches to science education which implicitly result in students learning that science facts are static and have been irrevocably proven. There is some evidence that this latter perspective, that what is known is known, coupled with the confirmatory nature of traditional laboratory activities, leads to a disinterest in students pursuing science as a career (after all, if most things are “known,” why would someone be interested in becoming a scientist?).

During this time other issues have entered into discussions of science education, including multicultural representations of science (following a developing understanding that other cultures interpret observed phenomena in different ways than the Eurocentric approach characterized in Western science), the lack of females participating in the sciences (with resultant programs to encourage more females to choose science as a career), and environmental issues.

This latter issue, first gaining educational prominence in the mid-1970s, has led to what is called STSE (Science, Technology, Society, and the Environment) education; building on STS education. This STSE perspective would encourage, for instance, students to develop an orientation toward genetically modified foods that was not one of just blind acceptance of what they were told by the biotechnology companies but one which instead took a more critical stance toward impacts of the technology on the environment.

Despite these changes over more than a century, textbooks have remained remarkably similar over that time. Although today’s science textbooks unsurprisingly contain information on more current science theories and practices, they are also remarkably consistent in presenting some content that is quite similar to textbooks from a century ago. For instance, cross-sectional diagrams of flowers (such as the tulip), seeds (such as the dicotyledonous beans and the monocots such as corn), and systems of lenses (for refraction and reflection) remain present in textbooks today in much the same way

as they did in textbooks a century ago (although today often in color, and presented with fewer labels and less detail than those earlier sources).

However, one notable change that has occurred in textbooks is the increased depiction of both females and visible ethnic minorities and their participation in science activities and in science as a career. In the 1940s and 1950s female students were infrequently depicted in textbooks, and the representations that were there showed male students performing lab activities while female students stood by and watched them setting up the equipment and doing the experiments. Although there are still arguments that biases exist, current textbooks are much more likely to depict a more balanced representation of both males and females and students from various ethnic backgrounds engaged in activities and showcase interviews with scientists from more diverse personal backgrounds. These, and other efforts, have led to a far higher participation rate of females and minorities in the sciences, although they are still underrepresented in chemistry and physics overall and in all disciplines at higher academic levels.

CHALLENGES FACING SCIENCE EDUCATION

Despite the amount of research conducted into science education in the United States, and the evolving perspectives on science education that have come into vogue since the 1980s, there is little evidence that much has changed in the classroom practices enacted by teachers. Many science classrooms continue to closely resemble those of the 1950s and earlier, dominated by theory and cookbook laboratory activities and often are lecture-based with the students copying notes and filling in worksheets. Even though considerable research conducted in the last twenty years has led to a deepening understanding of which educational practices will lead to improved science learning outcomes, there is little evidence that science education practices have changed at the classroom level in response. Although there are many reasons for this, a large influence is a political agenda that promotes standardized (i.e., multiple-choice) testing to determine science knowledge. Many teachers feel that lectures, worksheets, and textbook readings are the best preparation for these tests, and as a result their pedagogical practices have not evolved even though there is, in many research circles,

broad recognition that these tests are not very effective indicators of what students understand about science and its practices. Americans remain concerned that more reform efforts are needed and that the country continues to lag behind in preparing a workforce and a populace which are ready to cope effectively with decisions in a society where science and technology issues continue to be significant influences. A current contradiction, and one which may continue to remain unresolved, is that the public perception of what changes need to occur in the teaching of science to improve science literacy run counter to many of the findings of science education researchers regarding what approaches to the teaching of science actually improve science literacy. Until this contradiction is resolved, there is little possibility for an improvement in broad cultural scientific literacy in the United States.

G. Michael Bowen

HISTORY/SOCIAL STUDIES EDUCATION

Looking at the title of this entry a reader might assume that there is no significant difference between history and social studies education. Given that there is a political battle being waged between the two for prominence in the school curriculum, that assumption would be incorrect. We therefore need to define both history education and social studies education by looking at the goals of each academic approach, tracing their origins in the curriculum, and understanding why there is such controversy about which approach is better for America's students.

DEFINING THE TERMS

Merriam-Webster Online Dictionary defines history as "1. A tale or a story, 2. A chronological record of significant events (as affecting a nation or institution) often including an explanation of their causes; [and] 3. A branch of knowledge that records and explains past events."

This source cites the etymology of the word as from the "Latin *historia*, from Greek, inquiry, history, from *histOr*, *istOr* knowing, learned; akin to

Greek *eidenai*, “to know.” These definitions do not speak of a purpose for knowing beyond explaining past events; simply knowing the past appears to be enough reason to study it.

In a section titled “The Significance of History for the Educated Citizen,” the National Center for History in the Schools (1994) explains why history should have a prominent place in the curriculum. These reasons include the importance that a society shares a common memory “of where it has been, of what its core values are, [and] of what decisions of the past account for present circumstances.” The conclusion to this section relates that without studying history, a person cannot make any sensible inquiry into the political, social, or moral issues in society. Therefore, without historical knowledge and the inquiry it supports, the informed, discriminating citizenship essential to effective participation in the democratic processes of governance and the fulfillment of the nation’s democratic ideals cannot be achieved.

If we were to continue reading the introductory materials describing the study of history in the National History Standards published by the National Center for History in the schools (National Council for History Education [n.d.] mission statement), we would find that a study of history requires the development of both historical thinking and historical understanding. Historical thinking includes reasoning that “must be grounded in the careful gathering, weighing and sifting of factual information such as names, dates, places, ideas, and events,” while historical understanding “requires students to think through cause-and-effect relationships to reach sound historical interpretations, and to conduct historical inquiries and research leading to the knowledge on which informed decisions in contemporary life can be based.” These definitions then provide a purpose for history education that is twofold: to form common bonds in our society and to use our understanding of history to help us fulfill the obligations of citizens in our daily lives. This moves beyond accumulating past data to using it in our contemporary lives.

How does this differ from social studies? Part of the answer is that history is sometimes defined as part of the humanities (records of humankind), as opposed to a social science (a problems-solving approach). Part of the answer lies in divisions within the field of history about what is appropriate for stu-

dents to study. Is history simply knowing what happened and when it happened? Or is it knowing why it happened, how it happened, and what that means today? Further, if it is the latter, is there agreement on the why, the how, and the meaning? But what of social studies?

The Merriam-Webster Online Dictionary defines social studies as a part of a school or college curriculum concerned with the study of social relationships and the functioning of society and usually made up of courses in history, government, economics, civics, sociology, geography, and anthropology. The thrust here is interdisciplinary education to understand how a society functions.

The definition from a professional organization, the National Council for the Social Studies (NCSS 1994b), reads slightly different. They state that social studies is

the integrated study of the social sciences and humanities to promote civic competence. Within the school program, social studies provides coordinated, systematic study drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences. In essence, social studies promote knowledge of and involvement in civic affairs. And because civic issues—such as health care, crime, and foreign policy—are multidisciplinary in nature, understanding these issues and developing resolutions to them require multidisciplinary education. These characteristics are the key defining aspects of social studies. (National Council for Social Studies 1994b)

More concisely, NCSS states on its home page (www.socialstudies.org) that “social studies teaches the content knowledge, intellectual skills, and civic values necessary for fulfilling the duties of citizenship in a participatory democracy.” The focus is on students developing the knowledge, skills, and attitudes to perform the duties of citizenship in our republic. Aside from the integration of many more academic disciplines, are these definitions and goals really different? Looking at the history of these school subjects might provide part of the answer.

THE HISTORY OF HISTORY AND SOCIAL STUDIES

In 1892, a Committee of Ten was appointed by the National Education Association (NEA) to address education in the United States and to recommend a curriculum of study for the nation's schools. The committee broke into subgroups with a specific subcommittee on History, Civil Government, and Political Economy. There was an additional subcommittee on geography that made separate recommendations. Before the report was issued many schools taught a survey course in high school frequently called "general history." That course was labeled by the committee as having too many facts and too much memorization. Thus, as history became a formal part of the curriculum, the committee recommended a format of eight years of study in grammar school and four years of study in high school. The general history survey (a Western civilization and American history approach) was to be replaced by four year-long courses including ancient history, medieval and modern European history, British history, and United States history. Political economy was judged too difficult for the high school level. Geography was to be taught as a separate subject, although the committee did recommend the study of maps as part of the history curriculum.

Prior to 1890, history was taught as a "celebratory" history from the political and military tradition, based on the consensus that there were no deep conflicts in our society. That means that history was taught to increase American patriotism by celebrating the political and military conquests of the nation. The curriculum did not include serious explorations of race including slavery, poverty, or immigration. Where minorities were mentioned, the consensus was that African Americans were better off as slaves than they had been in Africa. World history meant the spread of white, male European civilizations over the "lesser" peoples of the world. What is most interesting about the Committee of Ten recommendation for history was a slight change in the teaching approach.

The committee suggested that teachers and students move away from simple memorization of facts and dates and toward interpretation of primary source documents, maps, and other historical materials. Recommended teaching methods included a topical ap-

proach (as opposed to chronological approach), debates, and visits to museums and historical sites. This was not supposed to be a curriculum focused toward just the college-bound but for every student completing formal education at the high school level. While the recommendations of the committee were strong, the reality is that history in the schools remained mostly celebratory memorization, and historical thinking and understanding (modern terms) were not introduced into the public schools. History remained dry, boring, and irrelevant to the majority of students. It should be noted that the turn of the twentieth century was a time of great upheaval in America with large numbers of immigrants pouring into our rapidly industrializing and urbanizing nation. Thus the history being taught seemed far removed from the concerns of these students. Additionally, the discipline of history was undergoing change.

There was a new generation of scholars attending to more than the traditional political and military approach to the study of history. Topics such as slavery, immigration, and labor history were beginning to take root. Charles Beard published his groundbreaking *Economic Interpretation of the Constitution* (1913) that focused on different document sources and drew different conclusions than traditional constitutional studies. Some might say that as this new history developed it subsumed many of the social sciences as scholars began to approach the study of history from not only political and military perspectives but added economic, social, religious, intellectual, and aesthetic considerations. Additionally, voices of those usually ignored by historians began to be explored. Conflict within the field of history over the legitimacy of including so many divergent viewpoints of events raged within the field. Who had ever heard of considering how Native Americans felt about the conquest of the West? Or how the Mexicans viewed the annexation of Texas?

Thus in 1921 when the National Council for the Social Studies was founded, originally as a branch of the American Historical Association, another committee was appointed and another curriculum was suggested. This new curriculum, a social studies curriculum, owes much of its approach to the progressive movement and the educational philosophy of John Dewey. This would be an interdisciplinary approach with a focus on problem solving using scientific method. History would be studied equally with

other social sciences in the context of the problem or topic being discussed in class. So, in the short term, schools adopted the four-year approach but it was short lived, and soon the world history survey course reappeared to make room in the curriculum for other social studies topics and courses deemed more relevant to the students in the schools.

This new curriculum became less history focused and more “life adjustment” focused. There was the introduction of courses titled “Problems of Democracy,” a current events approach. For traditionalists, this implied that there might be problems in America and it was unpatriotic to suggest to students in their formative high school years that there might be something not perfect in America. Thus in addition to the split among historians about what to teach, the rise of social studies sought to address concerns not previously covered in school: the Great Depression, the growing gap between the rich and the poor, racism, and the lack of civil rights for a significant number of citizens. It was obvious to many, including a major figure in the social studies, Harold Rugg, that students should be focused on solving these economic and social problems (Riley 2001).

Alongside the progressives, another smaller group, the social reconstructionists, believed that schools should teach active citizenship as a way of solving problems existing in our country. Writers like George Counts asked, “Dare the Schools Build a New Social Order?” (Riley 2001) Rugg then produced a series of textbooks that, while fully supporting our democracy, challenged students to explore topics such as the gap between the rich and the poor, urban problems, and world (not simply Western) culture and minorities. Rugg believed that as students encountered these problems they would strive to make America even more democratic. The backlash from traditional American patriots, for example, the American Legion and the National Association of Manufacturers, who were furious that anyone might think that America needed improving, was immediate and fierce. Rugg’s books, the best selling social studies texts of their time (1940s), were targeted in a smear campaign and removed from the schools. With the end of the Depression and the rise of the Cold War, history/social studies education reverted to its original format.

It is also true that in many schools the suggested course of study for four years of world (Western)

history, U.S. history, and geography all but disappeared; though many two-year history programs generally remained. And those two year programs remained in traditional, textbook driven, memorization formats despite calls for a more vibrant, living history by all history/social studies professionals. This call for improvement in either the social studies or the history curriculum seemed to pass teachers by. Students continued to memorize facts and dates, to study military campaigns, and to move from era to era without any depth of understanding of how we came to be who we are. Textbooks then responded to the threat of the Cold War and McCarthyism, and modern history became the study of “us versus them.” The celebratory history triumphed as any suggestion that there were inequity and racism in American society was glossed over.

Despite the rise of the “new social studies” in the late 1960s and early 1970s, which tried to focus students on learning the way historians learn, using the tools of the discipline by studying documentary evidence, looking in depth at local history and problems sometimes called “post-holing” (as opposed to survey courses) and the emergence of minicourses like Black history or women’s history, very little changed in the teacher’s approach or the students’ experience. History/social studies was still about textbooks and the memorization of huge numbers of facts and dates.

Then in 1983 came the publication of the Carnegie Commission’s famous report *A Nation at Risk*. The call was for reforming the curriculum to go “back to the basics,” which meant more history/social studies including world history (not simply Western civilization), geography, U.S. history, economics, and government (civics and American government) (National Commission on Excellence in Education 1983). As a result of this call and a subsequent call to improve school curriculum commonly known as Goals 2000, the call for national standards for history/social studies was made and the current battle for the curriculum was joined.

HISTORY VERSUS SOCIAL STUDIES

The result of the invitation to create national standards resulted in a glut of standards in the history/social studies category. There are NCSS social studies standards, “*Expectations of Excellence*” (1994b), that contain ten broad themes:

1. Culture
2. Time, Continuity, and Change
3. People, Places, and Environments
4. Individual Development and Identity
5. Individuals, Groups, and Institutions
6. Power, Authority, and Governance
7. Production, Distribution, and Consumption
8. Science, Technology, and Society
9. Global Connections
10. Civic Ideals and Practices

These themes are interdisciplinary and are guides to enable teachers to meet the mission of NCSS to prepare effective citizens. The historians were invited but chose not to join in the process of developing the social studies standards. Instead, the historians met separately, did not invite NCSS, and developed their own standards. The feeling became that there must be a choice—one or the other—however, that is not really true.

In the view of NCSS, these social studies themes work in concert with the more specific content standards developed by the individual disciplines of history, economics, geography, and government/civics. Phipps and Adler (2003) explain the co-necessity of the single subject standards operating within the larger context of the social studies standards and a way to ensure that the factual base and major concepts of the disciplines are included in social studies classrooms. This interweaving of standards is backed by numerous examples of successful, content rich lesson plans in professional journals for teachers like *Social Studies* and *Social Education*, and on the Internet. The content and primary sources available to teachers and students overshadow anything previously imaginable and provide easy ways to remove social studies from lecture, textbooks and worksheet strategies, and into the real world. These examples do not shy away from the controversial issues and problems that intrigue our students and could help transform them into active, caring citizens.

Many teachers are content with lectures, textbooks, and worksheets and do not use these resources, however. In addition, the implementation of high stakes testing required by many states and by the *No Child Left Behind Act* (although social studies is exempt from this federal law at this time), and fact-based, multiple-choice tests only reinforce

traditionally unsuccessful teaching strategies. There is nothing wrong with high standards. The question is the content of those standards and the kinds of assessments and evaluations that accompany them.

The media has been full of articles and discussions defending a single subject history, government, geography, and economics approach over an interdisciplinary social studies approach. Is there any merit to the argument? In reading the literature and newspaper discussions the real problem lies in unstated assumptions.

First, neither approach is inherently rigorous. Rigor, in the final analysis, has more to do with what the individual teacher requires of students than the subject matter of the course. And, if history has subsumed social studies by adopting multiple perspectives beyond celebration of our past, then the real issue is for history advocates to stop arguing with social studies advocates and to work together to provide these challenging lessons for students in classrooms. In many ways this fits with the topical approach suggested by the Committee of Ten in the 1890s before the field of social studies existed! However, social studies had become politically unpopular to a large number of leaders in our nation and the attack began.

Many historians believe that social studies is watered-down and meaningless and that only the study of history provides rigor and training in critical thinking and problem solving that students need to become productive members of society. Several prominent leaders and foundations have jumped on the history bandwagon to lead this attack. However, they never actually define rigor beyond stating that history has it and social studies does not. Despite recent headlines that might indicate the opposite, it is nothing new that America's school children seem deficient in basic content knowledge regarding United States history, world history, geography, government, and economics.

Students are now regularly given a seemingly unending series of high-stakes, multiple-choice tests ranging from the NAEP (National Assessment of Educational Progress), the CTBS (Comprehensive Test of Basic Skills) and individual state tests where required. The underlying assumption is that the inability to perform well on these tests is correlated with the goal of creating active, informed citizens who understand their past and how it relates to the present

and the future. They also assume the reverse: that increasing performance on these tests will enhance the attainment of this mission. But there are no data to back up these assertions.

With that in mind, what exactly is the pro-history, anti-social studies solution being promoted? A careful reading of the current agenda (see the Fordham Foundation Report *Where Did Social Studies Go Wrong* [Frazee and Syers 2003]) yields a much deeper and more serious split between history and social studies. According to Rochester (2003) in “The Training of Idiots: Civics Education in America’s Schools” from the Fordham Foundation report, the solution consists of the right balance of civic information and civic interest. This list of six principles includes:

1) The importance of studying American history—*“their history [italics original]—in its own right and not merely as part of some ‘integrated’ world history and, that this be a ‘more accurate rendering . . .’* (p. 27). The question of ‘accurate to whom’ is explained as less study of ordinary people and minorities and more focus on the accomplishments of traditional heroes such as Washington and Jefferson. This contradicts many social historians who believe that if all that is studied is the founding fathers, without the context and understanding, the ordinary colonial American and his/her life, for example, then we cannot understand the American Revolution at all.

2) We should be more laudatory about the “extraordinary achievements of the American political system . . .” (p. 27). While Rochester does state that we should “acknowledge a racist, sexist past that still lingers to some extent” (p. 27) he cites Havel saying that we really can’t do too much better because ‘people are people’ and democracy will always be an ideal. Thus, we should downplay any negatives and focus on how great we really are. For our students in inner cities, rural areas, or from immigrant homes facing anti-immigrant expressions, this is problematic and actually causes them to feel betrayed by the study of history.

3) “We need to stress the importance of starting with a common base of factual information about the American historical and contemporary experience” (p. 27). Note that there is no discussion about the tentative nature of factual knowledge or multiple perspec-

tives in relation to what constitutes factual knowledge. This entry, and the Fordham report as a whole, assumes an agreed upon factual base for American history and government that many historians (in addition to social scientists) find problematic.

4) A need to cultivate teachers who are not only passionate about children but about their subject matter. This section continues stating, “process is no substitute for content” (p. 28). In an earlier section of this chapter the criticism focuses on learner-centered approaches and society-centered approaches (defined as focusing on problem solving) as inadequate compared to knowledge-centered approaches to teaching. Knowledge-centered appears to be synonymous with teacher-centered to this author. “Teaching about politics is more likely to come alive with a serious, captivating lecture than with fun and games” (p. 28). There does not seem to be an in-between teaching strategy that might interest students and seem relevant to their lives.

5) “We need to engage students in the right ways” (p. 28). This short paragraph focuses on what the author deems acceptable service learning, for example, going to the polls on Election Day with their parents for “Kids Voting.” There is no discussion of what to do about parents who do not vote, or vote when children are otherwise occupied with school, and so forth. Nor is there a mention of what experts in service learning define as effective service learning, which is vastly more complex than watching parents vote.

6) “We need to create fewer doubters and cynics” (p. 28). The statement here is that our system works, albeit imperfectly, and that promoting “intellectual and moral relativism” is a mistake. We need, says Rochester, to give “children the strong grounding in knowledge and values that will hopefully result in a greater sense of political efficacy.” Thus, the intellectual truth and moral truth are given, which will create more political value. That might be efficient, but it assumes only one viewpoint in an increasingly diverse society. Isn’t democracy based on the fact that the truth is not a “given,” but that discussion and compromise over serious intellectual and moral disagreement is how we best demonstrate our democratic values?

Part of the problem between history and social studies ultimately centers on teacher understanding of

the subjects being taught and the political nature of history/social studies as a school subject. Teachers need deep content knowledge and understanding of the major concepts of the individual disciplines that combine to create interdisciplinary social studies. Clearly that might be more difficult to master with a multidisciplinary major (social sciences) than a single subject major (history). A case could be made that that is the reason Dewey, and progressive education in general, are so frequently misunderstood. A highly qualified teacher who takes a truly interdisciplinary approach to education requires a range of intellectual interests and knowledge—almost as we would define a Renaissance person. The culprit here is the need for more intellectual teachers—something our society does not reward with either money or respect. Students do need content knowledge to integrate into their problem solving. To some extent, the issue is over who determines the factual content needed and the problems outlined for solutions in the curriculum.

For those promulgating a history approach in the public press, the factual content is not an area of contention. What is stated in the Fordham report is the real agenda: to “stress the continuing centrality of the West; include other cultures but honestly—warts and all, East and West; note the contradictions of the global education ideology; stress the superficiality, inaccuracy, and blandness of ‘world cultures’ and ‘world history’ materials; [and] encourage stronger narrative history with a focus on moral and political action” (65–66). Thus it isn’t just more history that is needed, it is more of a particular approach to history with a particular purpose in mind.

The problem is that Americans do not all have the same vision for our students. We all want active, concerned citizens but that does not necessarily mean the same thing to all parties. The Fordham report makes clear that what social studies educators advocate as critical thinking and problem solving through interdisciplinary learning, the history advocates are tarnishing because they do not envision the same curricular goals by definition. While one group is trumpeting “E Pluribus Unum” (out of many, one) others ask, “Who’s Unum?” In other words, who will decide what the definition of “one” will be in terms of values, beliefs, and practices?

This problem of unum becomes very clear when reading the chapter from the Fordham report titled,

“Multiculturalism and Social Studies” (Ellington and Eaton 2003). The NCSS vision of preparing students to live in a diverse America with a multiplicity of perspectives is not the goal of the Fordham Foundation. It is clear that their definition of history means their view of history: Western-based, celebratory history, fact-based, and with primary source documents heavily packaged as everyone’s unified vision and understanding.

But in reality there is diversity in our classroom. We have nonreaders, homeless children, children in poverty, and those without proper health care. How does this celebratory version of history help them attain the tools needed to become productive members of society and active citizens improving the lives of all Americans? I do not believe that social studies professionals and teacher educators accept the view of the Fordham Foundation when faced with this reality. However, I do believe that many practicing social studies teachers do accept that view and still their students fare poorly on standardized tests that are fact-based and traditional.

Thus, the real threat is that social studies teachers will do less in the way of enforcing a unified view of history as defined by the political right. In the end, this is a question of philosophy and values. What is the vision of America and the world that students should have as they attend school, graduate, and enter the real world of the twenty-first century? Which approach is better suited to achieving that vision? There is a deep divide in America and one place it is surfacing is in the battle between history and social studies education.

Barbara Slater Stern

VISUAL ARTS

The term “visual arts” is an academic heading that gained prominence in England in the eighteenth century. In this heading the word visual is an adjective used to highlight this category of the arts and distinguish this subset from other art forms of the time. The visual arts are generally thought of as the fine arts, along with dance, music, and theatre. Refining these distinctions further still are three headings offered in 1999 by John Keefe, MA, Principal

Curator of Decorative Arts, New Orleans Museum of Art, listed under fine arts in the World Book *Multimedia Encyclopedia*: visual (fine and decorative); auditory (music, opera, and drama); and performing (music, dance, film and theatre arts). Today, in settings where the arts co-exist, distinctions are made most often in educational environments and in funding categories.

The term “fine arts” is associated with the École des Beaux-Arts and more specifically The Académie Royale de Peinture et de Sculpture in seventeenth century France. According to *The Oxford Dictionary of Art*, Charles Batteaux’s work *Les Beaux Arts réduit à un même principe* contained categorizations for the fine arts that were as follows: “useful arts, the beautiful arts (sculpture, painting, music, poetry), and utility (architecture, eloquence).” The philosopher D’Alembert also listed the fine arts as “painting, sculpture, architecture, poetry, and music” in Diderot’s *Encyclopédie* (1965). In England this list was recognized but sometimes also referred to as the “five arts,” *The Oxford Dictionary of Art* continues. The visual fine arts were also defined as drawing, painting, and sculpture in England. Sir Joshua Reynolds, acting as the first president of the Royal Academy of Arts in London, encouraged awareness of the visual arts to the public. Sir Joshua Reynolds’s fifteen *Discourses on Art*, the quintessential text, published in English, outlined the Academy’s ideals. Membership to the Royal Academy elevated the status of the professional artist and entitled the member to use the Royal Academician initials of “RA” and Associate “ARA” after their names respectively (Clarke 2001). Three centuries earlier, the Renaissance scholar Leon Battista Alberti celebrated the discipline of painting for the beginner by writing about this “subtle art” in *On Painting* (1991). Sculpture and the performing arts were considered branches of the arts as well during this period in Italy. Leonardo da Vinci paved the way for future artists when he broke the cycle for church-appointed painters to allow for a period of reflection during the creative process, raising the level of recognition for the visual arts from an applied art to a fine art. He is considered to be a pivotal visual artist who coupled the concept of ideas with practice.

In medieval times the fine arts were defined as arithmetic, astronomy, dialectic (logical reasoning), geometry, grammar, music, and rhetoric. These seven areas or branches of learning were also known as the

liberal arts. Today we find the vestiges of these origins in academic terminology such as “arts degree.”

The visual arts include a wide range of media that have developed from academic classifications to today’s diverse and complex categorizations. Popular culture along with academic fields of study have divided or categorized the arts to be performing or visual. The term “arts” generally is associated with the “fine” arts and not usually the “applied or decorative” arts, although at times these boundaries are blurred.

In America, the visual arts are first seen in the works of Native Americans who produced carvings, rock paintings, and weavings as a means to express their tribal culture. Throughout the colonization of America these earlier works bore little notice, but as the nation developed a recognition of regional folk art emerged. László Moholy-Nagy, a student of law and an artist, began his teaching career by first working with Walter Gropius at the Bauhaus and then directing, from 1937 to 1938, the short-lived existence of the Bauhaus School of Design in Chicago. He founded the Chicago Institute of Design, where he remained until his death in 1946. In his book *Vision in Motion* (1961), Moholy-Nagy describes the economic factors that governed a resource-rich country like the United States, along with how these conditions demanded a different approach to the art of design than existed in Europe. He raised awareness of the principles of basic design and influenced commercial and industrial design development in the United States placing them in prominence alongside academic art.

Traditional categories for the visual arts along with highlighted artists working in these media are: Drawing (Leonardo da Vinci, Sol Lewitt); Painting (Jennifer Bartlett, Artemisia Gentileschi, Wassily Kandinsky, Jacob Lawrence, Edouard Manet, Alice Neel, Jackson Pollack, Georges Seurat, Jan Vermeer); Sculpture: open, closed, soft-art, fixed, time-based, virtual (Alice Aycock, Louise Bourgeois, Marcel Duchamp, Alberto Giacometti, Henry Moore, Fukami Nakamura, Claes Oldenburg, Rick Paul, Martin Puryear, David Smith); and Architecture: traditional, theoretical design, landscape design, earthworks (Antonio Gaudí, Rem Koolhaas, Maya Lin, Robert Smithson, Frank Lloyd Wright). From these traditional categories the visual arts evolve to include in alphabetical order: Animation/Storytelling (Chris Van Allsburg); Artists’ Books and Paper Engineering (Robert Sabuda, Keith Smith,

Mary Stewart); Appropriation (Jeff Koons, Sherrie Levine); Collage (Romare Bearden, Georges Braque); Computer Graphics and Visual Communications (Bonnie Mitchell); Conceptual Art (Joseph Kosuth) Craft (ceramics, fiber, glass) (Judy Chicago, Dale Chihuly, Michael James, David Mac Donald,); Film (Alfred Hitchcock, Cindy Sherman, John Waters); Folk Art (Cultural); Graphic Design (Ken Botnick, Andy Warhol); Illustration (Leonardo da Vinci, Michael Mastermaker); Jewelry (Cultural); Mosaic (Cultural); Mural (Diego Rivera); Naïve (Henri Rousseau), Narrative: graffiti, installation, text, and image (Jean-Michel Basquiat, Keith Haring, Jenny Holzer, Barbara Kruger, Duane Michals); Performance (Vito Acconci, Laurie Anderson, Gilbert and George, Robert Wilson); Photography (Ansel Adams, Eadweard Muybridge, Cindy Sherman, Alfred Steiglitz, Edward Weston,); Printmaking (Albrecht Dürer, Katsushika Hokusai, Lisa Mackie); Site-specific Installation (Christo & Jeanne-Claude, Robert Irwin); Video (Nam Jun Paik, Bill Viola). Within these categories there exists hybrid combinations that support interdisciplinary platforms primarily seen in the additional categories of Installation, Performance Art, and the Visual Book.

The role of the visual arts in the history of American education has maintained a presence while experiencing a shift from earlier practices that mimicked academic mastery of a specific medium to discovery of self through the arts. In John Dewey's *Art as Experience* (1934), we are presented with the duality of art as experience and art as a language. The author points out that a work of art is not only viewed as an historical marker, indicating a period in history or a specific artist's progression, it also contains a resilience or everlasting quality that comes from the experience it provides the viewer each time the work is processed. He goes on to say that "because objects of art are expressive, they are a language. Rather they are many languages. For each art has its own medium and that medium is especially fitted for one kind of communication. Each medium says something that cannot be uttered as well and as completely in any other tongue."

In *Focus on Fine Arts: Visual Arts* (1989) by Don L. Brigham, the author cites two references to seeing patterns and making connections. Brigham first states, "the inability of students and teachers to draw connections among disciplines has resulted in a fragmen-

tation of learning." Secondly he refers to a 1989 statement by Ernest Boyer, then President of the Carnegie Foundation for the Advancement of Teaching, about "the role arts education may play in overcoming departmentalization of learning. . . . After visiting colleges and schools, I am convinced that students at all levels need to see connections . . . finding patterns across separate disciplines can be accomplished through the arts . . . the arts gives us a language that cuts across the disciplines, helps us to see connections and bring a more coherent meaning to our world." Brigham goes on to highlight what we already know from past practice, that visual arts education focuses on the student as an individual, enabling them to communicate on many levels. As he describes it, "one of the outcomes of the visual literacy movement in the 1970s was the introduction of filmmaking as part of many curricula . . . for students who had previously considered dropping out of school." This example demonstrates how the film medium transformed from visual aid to visual art in the service of education. Film and video provide an accessible medium of expression for students lacking any combination of communication skills. Successfully expressing ideas and emotion can lead to the building of confidence and the discovery of knowledge. Learning the language of the visual arts is symbolic and great emphasis is placed on a national standard for visual arts education. For the "curriculum studio" in visual arts, three levels or divisions correspond to a student's K-12 educational level. The visual art areas are described as drawing, painting, sculpture, design, architecture, film, video, and folk arts. The national standards for visual art education as put forth by the U.S. Department of Education contain learning objectives that are as follows:

1. In primary settings, K through grade four, the introduction and use of art materials and media are stressed along with exploring methods for effective communication. Developing observational skills that eventually will allow for the ability to "describe, interpret, evaluate and respond to work in the visual arts are also a goal."
2. In grades five through eight, "Visual expressions become more individual and imaginative." Attention is on problem solving as it pertains to the art-making process. Historical and cultural contexts allow an example to be

made of the visual arts in mirroring appreciation and connection to the world we live in.

3. In grades nine through twelve, students operate with a more sophisticated approach to the visual arts, having developed their skills throughout their primary and middle school education. Focus in high school is on expression of feelings and emotion and on developing a framework to promote a mature understanding of works of art along with context and aesthetic qualities. Students can also “reflect on the nature of human involvement” and differentiate between alternating roles as “viewer, creator, and participant.”

The shift in art education from individual discovery and mastery of a specific medium to performance and self-discovery in the studio environment helps the student develop a more integrated approach to

the study of art. While less emphasis is placed on the mastery of skills, students still learn the formal language of the visual arts by exploring formal elements of design: Line, Shape, Tonality (light and dark), Mass (volume and form), Color, Space, and Texture, as well as the organizational principles of compositional design: Unity and Variety, Balance (Symmetrical/Asymmetrical), Emphasis and Economy, Focal Point, Contrast, Rhythm and Repetition, Scale and Proportion. As in the past, these formal guidelines remain to promote the understanding of the language of art. Building on this language, it is also necessary to understand certain terms that are used by the artist to express a given reality: Representational, Non-representational (non-objective) or Abstract; Conceptual, Idealistic, Illusionistic, Naturalistic, Realistic, Stylized.

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INFORMAL LEARNING

The literature is replete with numerous studies on formal, nonformal, and informal learning. These three broader approaches to the nature of learning provide a wide conceptual framework for the understanding, categorization, and acquisition of knowledge. In the literature, formal learning generally refers to the teacher who follows a pedagogical-content plan. The standard paradigm includes: outcomes or learning objectives, a prescribed learning framework, designated credentialed instructors, awarding of credit, time at task, and instruction sponsored by a recognized institution. D. W. Livingstone's report on formal, nonformal, and informal learning describes a broad framework to determine the boundaries of formal learning (2001). He states that formal education occurs "when a teacher has the authority to determine that people designated as requiring knowledge effectively learn a curriculum taken from a pre-established body of knowledge . . . whether in the form of age-graded school systems or elders initiating youths into traditional bodies of knowledge (p. 3)."

Unlike formal learning, "informal learning" is more difficult to define because there is no consensus among educational researchers as to its meaning. Therefore, the prudent definition of informal learning is basically defined by what is not formal. Informal learning results from everyday activities that are related to work or leisure. The standard informal learning paradigm includes: the transfer of tacit knowledge, limited planning of instruction to allow incidental and spontaneous learning opportunities, and a learner-centered environment which is context specific. According to Livingstone (2001), informal learning is "any activity involving the pursuit of understanding knowledge or skill which occurs without the presence of externally imposed curricula . . . in any context outside the pre-established curricula of educative institutions (pp. 5–6)."

It is evident from the literature that differentiating between informal and nonformal learning can be problematic and can cause erroneous assumptions. The characteristics that define each concept have considerable theoretical overlap. In fact, there is marked disagreement as to the existence of solely informal or nonformal learning. Billett (2000) suggests that all learning takes place in social organizations such as work environments, family settings, or athletic organizations and these organizations have structures to transmit knowledge. For example, the task of earning a merit badge by a Boy Scout is formalized in the procedures and skills required to be successful. Consequently, the differences between what one would consider as formal or informal learning experiences are of degree, setting, or the intended nature of the activity. Further, the debate regarding the differences among the three forms of learning embodies assumptions about the implicit or explicit nature of one form of learning over the other. These discussions generally include the relative effectiveness of each type of instruction in the transfer of both knowledge and skills. A clear analysis among the three forms of learning—formal, nonformal, and informal—can only be discussed in relation to the nature of the contexts or particular purposes of specific learning activities.

FORMAL AND INFORMAL LEARNING AS COMPETING FRAMEWORKS OF LEARNING

The concepts of formal and informal frameworks of learning can be found in the Sophist tradition in classical Greece of the fourth and fifth centuries B.C.E. Isocrates' (436–338 B.C.E) work implies that the study of rhetoric and the perfection of an encyclopedic education were important goals of a progressive Athe-

nian society. The former paralleled informal learning, and the outcome was a practical kind of schooling for the formation of the Athenian citizenry. The latter, being more formal in nature required a broader education to meet the demands of a changing complex society.

Aside from these modes of study, there were at least two philosophical viewpoints as to the meaning of formal knowledge. On the one hand, Plato argued in favor of formal knowledge in universal terms in that deductive reasoning was the primary vehicle in obtaining a conclusion to a valid argument. The end result for any formal knowledge task through Plato's point of view was certainty—that is, a result is necessarily the outcome of any two initial statements or antecedents. In stark contrast to this view, the Sophists, Isocrates in particular, argued that Plato's contention failed to include everyday experience, empirical evidence, and the notion of cause and effect. Instead, the Sophists' view of formal learning was more probabilistic and relativistic in nature and not based on certainty. To this end, formal knowledge, for the Sophists, was primarily concerned with the degree to which an outcome occurred, and not solely on absolute terms (e.g., always, never).

Since the Age of Enlightenment, numerous ways of instruction were formalized to improve upon simple everyday tasks. The nature of organizing and clarifying these tasks appeared to make learning more effective. The learning from these types of situations became generalizeable, and could be applied in a wide range of contexts and circumstances. In contrast, everyday knowledge was believed to be specific to the situation or context (e.g., learning how to repair shoes). Thus, formal knowledge that was considered to be generalizeable to numerous situations was considered to be more valuable (e.g. learning laws of physics and applying them in numerous situations).

Sylvia Scribner and Michael Cole (1973), reflecting on the work of Lev Vygotsky, the well-known early twentieth-century Russian cognitive psychologist, helped to establish a counterview from a socio-cultural or situated perspective on learning. This counterview suggests that certain concepts and skills may be learned more effectively through informal processes. Vygotsky's (1978) work on language and thought demonstrates the importance of informal learning communities on the transfer of particular forms of knowledge. His work has given rise to a

number of areas of research, which include situated cognition (proposed by Jean Lave and Etienne Wenger 1991), scaffolding (proposed by Jerome Bruner 1975), and the development of spontaneous, everyday concepts.

Vygotsky (1978) makes the distinction between spontaneous, or everyday concepts and scientific, conceptually systematic concepts. Spontaneous concepts are concepts that people develop within their informal, everyday environment. These concepts are like little reflections, strong in what concerns the situational, empirical (what the individual experiences and interprets through sensory input), and the practical. In contrast, scientific concepts, also generally identified as conventionally systematic concepts, refer to a hierarchical system of interrelated ideas. Scientific concepts are highly organized and systematic. For example, school instruction, which is formal in nature, is intended to prepare a student to be cognizant of particular concepts and their relationships.

Fundamentals of systematization enter the individual's mind through scientific concepts. Vygotsky (1978) maintained that instruction in scientific concepts is very helpful because it supplies individuals with broader frameworks in which to place their spontaneous concepts. For example, a young boy might have developed the spontaneous concept of a car, but his concept is primarily based on his experience with his mother's car. If one asked him to define the term, he might state, "it's red, takes me places and has a special seat for me." Formal instruction, in which the teacher diagrams modes of transportation (including concepts such as coupes, sportscars, sedans, hatchbacks, or trucks, buses, or modes of rail transportation) can give the child a broader framework in which to place his spontaneous concept and help him understand the broader concept of a "car."

Vygotsky, then, believed that spontaneous concepts moved in an upward manner while scientific concepts had a downward movement (1974). In Vygotsky's own words: "The upward everyday [spontaneous] concept clears a way for a scientific [conventionally systematic] concept and its downward development. Scientific concepts provide structures in turn for everyday concepts by making them conscious and deliberate" (p. 108). James Hiebert and Mary Lindquist (1990) discuss informal and formal knowledge in relationship to mathematical under-

standing. Like Vygotsky's view of spontaneous concepts, Hiebert and Lindquist's position suggests that informal knowledge is comprised of intuitions, perceptual information, invented strategies, and other knowledge that has been acquired in experiencing quantitative challenges in everyday situations.

MOVING BEYOND DEFINITIONS

In summary, the definitions of formal, informal, and nonformal learning were discussed. Formal methods of instruction probably existed whenever two or more individuals convened to complete a particular task. Learning had become more formalized as individuals perfected ways to complete tasks and one of the individuals became more adept at a particular task than others. His or her tacit knowledge allowed the individual to be recognized as the authority, whose function was to transfer that knowledge to other individuals. The division between formal and informal/nonformal became more pronounced as societies became more advanced. As these societies advanced both socially and technologically, the systematic transfer of information became highly valued. Due to its higher level of efficiency, systematic transfer required the formalization of information. Further, as learning was dissected and reduced to specific components, a division between informal and nonformal learning was created. In examining each kind of learning, the dichotomy between formal and informal/nonformal learning may be more philosophical than practical in nature. As suggested by Vygotsky (1978), there is a required integration between the spontaneous/everyday knowledge obtained in informal situations and scientific knowledge taught in formal settings. Therefore, the need to distinguish between these learning paradigms may provide limited utility.

It is evident from the literature that learning is a complex activity with an infinite number of components. The boundaries created by definitions among the various dimensions of learning are artificial and deal with a static set of circumstances. Learning is a dynamic human activity in which formal learning (e.g., lecture and discussion of wastewater runoff) can take place in an informal setting (e.g., park) or informal learning (e.g., building structures and balanced forces) can occur in a formal setting (e.g., kindergarten classroom's block area). The nature of the learning activity can best be understood by recognizing the syn-

ergy produced by the interrelationships among formal, informal, and nonformal learning rather than using a reductionist view of these learning paradigms.

Stephen J. Farenga

EVERYDAY AND INFORMAL KNOWLEDGE

Epistemology is the study of the origin of knowledge. Epistemology has a long and rich record dating back several millennia. The Western debate on the origin of knowledge is dominated by two philosophical schools of the thought—the empiricist and the rationalist traditions. These traditions date back to the classical Greek period. The empiricists claim that experience is the source of all knowledge. That is, empiricists hold that knowledge can come only from observable phenomena. Aristotle was an early empiricist. Today, when we say that a study is “empirically based,” we mean to say that the study is based on observable, quantifiable phenomena. Alternatively, the rationalists argue that knowledge arises from human reason and logic. Plato was an early rationalist. Strictly speaking, the rationalists do not require direct experience with phenomena in order to identify knowledge. A deep divide exists between the radical advocates of each perspective. Yet, as one might suspect, many philosophers did not see empiricism and rationalism as mutually exclusive. There are many subdivisions of philosophies within and across these philosophical schools. Collectively, however, these philosophical orientations have come to define the modern scientific epistemological orientation known as logico-positivism.

Since Aristotle and Plato, there has been a great deal of discourse on how the human brain functions, how people learn, and how knowledge is created. Today, debates on these topics have produced radical changes in epistemology. We can now say that the everyday ways of thinking and knowing are very different from that advocated by the logico-positivist. These changes were precipitated by a confluence of events in the early part of the twentieth century. These events challenged neat and tidy explanations of thinking and knowing presented by the prevailing

logico-positivists. Around this time there was increasing dissatisfaction with the modern logico-positivistic view. For example, the philosopher Karl Popper (1902–1994) argued that observation and reason alone could not account for the progress of scientific knowledge. Popper (1963) suggested that intellectual intuition and imagination were more important than observation and reason. Furthermore, Popper refuted the notion of objectivity in science by introducing the idea of theory-laden observation. Accordingly, Popper asserted that scientific theories (explanations for phenomena) are constrained by pre-existing conceptions. Consequently, observations of phenomena are mere interpretations and subject to dispute. These thoughts eventually opened the door to a school of thought known as the Sociology of Scientific Knowledge (SSK).

In 1962 a philosophical watershed appeared and divided contemporary views of science from traditional, rationalist views. At the time, Thomas Kuhn (1922–1996) presented, in *The Structure of Scientific Revolutions* (1962), a model of theory-change in science. Progress in science from Kuhn's perspective occurred through a revolutionary process. Kuhn argued that the incommensurability of competing paradigms precluded the type of transition and transformation represented by the prevailing philosophical views. The new paradigm presented by Kuhn highlighted the context-bound, cultural-embeddedness of scientific theories.

At about the time when the sanctity of scientific knowledge was being challenged, entirely unique sets of questions were being raised in new and very different programs of study across psychology, philosophy, and education. Some of these programs claimed authority by associating with the postmodern (post-Kuhnian) zeitgeist. When synthesized, contributions from notables such as L. S. Vygotsky (1896–1934), Jean Piaget (1896–1980), Maria Montessori (1870–1952), Noam Chomsky (1928–), Rosalind Driver (1941–1997), Albert Bandura (1925–), and Ernst von Glasersfeld (1917–) yield a much richer and more robust portrait of the human mind and a far more complex epistemological vision. Today, we now are aware that meaning and understanding of the world around us are constructed from complex processes.

The knowledge we create for ourselves is influenced by experience, the situation or context of that experience, language, beliefs, and deeply held, per-

sonal theories about the external world. Furthermore, the knowledge we create is not always directly accessible (or explicit). That is to say, the knowledge we possess may be tacitly held and beyond our immediate awareness, yet it does, nonetheless, influence our actions and interactions with the external world. Informal learning has been described as a natural way of knowing. In this natural way of knowing, people develop complex conceptions, or theories that explain the world around us. They create deeply held belief systems that are difficult to challenge and change. However, this tacit knowledge, alternatively known as informal knowledge, often goes unchallenged. And, if challenged, people will go to great lengths to protect what they believe. Because this knowledge frequently remains unquestioned, it seldom undergoes any rigorous testing (self-examination) and systematic revision. Largely, these personal theories cannot hold up to the type of scrutiny exhibited by more expert perspectives. Therefore, these deeply held personal theories of how the world works are referred to as alternative frameworks. That is, the cognitive frameworks are alternatives to the more robust framework(s) of knowledge accepted within the scientific community. The alternative frameworks and informal knowledge of learners are of great interest to educators because unquestioned knowledge structures may lead to misconceptions (or naïve conceptions) within particular knowledge domains such as science or mathematics. There is a rich body of evidence showing that naïve conceptions often have deleterious effects on the acquisition of new knowledge. The cognitive transition from alternative frameworks to more robust, adequate theories is known as conceptual change.

Teaching for conceptual change is a centerpiece in current educational reform efforts. The aim is to encourage students to challenge what they know (what they have learned informally) in such a way as to promote a positive shift toward more robust knowledge structures and understandings. Nonformal learning environments are particularly well suited to providing opportunities to challenge students' thinking in ways that are more natural and conducive to conceptual change. In most cases, they are purposefully designed to situate new learning in meaningful contexts. In nonformal learning environments, there is a much more natural fit between the processes and outcomes

associated with meaningful learning. To recall, deep conceptual understandings are facilitated when: (1) learning tasks are embedded in authentic situations; (2) the learner is introduced to ideas and concepts in familiar contexts; (3) the learner is expected to apply his or her knowledge in new or unfamiliar settings; (4) there are opportunities for the learner to self-direct or self-engage in learning activities; (5) the social setting is supportive and positive; and (6) the learner is given the opportunity to make explicit what has been learned informally through social exchange and language-rich interactions.

John A. Craven

INFORMAL LEARNING ENVIRONMENTS

The experience of learning in schools is common among people in postindustrial societies. Many people may associate the concept of learning most closely to familiar formal education settings such as schools and classrooms. Yet much of what is learned is not learned in the institution we call “school.” Rather, much of our knowledge about the world around us comes from places outside of the school context. These places include our homes, playgrounds, zoos, museums, parks, libraries, community centers, nature centers, public gardens, clubs, and after-school programs. The area in front of the television, the digital environments associated with computer games, virtual reality interfaces (distance education), and the many other realms available through the Internet are also powerful and influential learning centers. When considering all of non-school-based learning environments, whether they are averaged over a typical week in a student’s life or averaged over one’s lifetime, the time spent learning in a classroom is relatively miniscule when compared to non-school-based learning contexts.

From a broad perspective, non-school-based learning centers are classified as nonformal learning environments. As the name implies, informal learning environments are structurally very different from formal learning environments. Nonformal learning

environments are the ones most adults will have access to once their formal education ends.

In recent decades, much has become known about the differences among formal and nonformal learning environments. At the same time, we have learned a great deal about learning itself, particularly its processes and outcomes. There is now considerable evidence showing that learning (as a cognitive enterprise) is impacted by the environment, or context, in which it occurs. But the context of learning extends beyond the stimuli and resources found in the place of learning. The context of learning now includes the vibrant mix of human interaction, motivation and interest, emotion, culture and language, prior knowledge and personal theories, and cognitive and physical activity that may contribute to or impede one’s cognitive development. The complexity of this system leads many educational researchers to describe the dynamics of intellectual growth and development as the “ecology of learning.”

Recent research sheds important light on learning that takes place outside the school. Ecological views of learning and the advancements in understanding the social, neurological, physical, cognitive, and affective components involved in learning are underscoring the role that nonformal learning environments serve in producing life-long learners who are well equipped to adapt and thrive in knowledge-based societies. The interest in and need to further understand the ecology of nonformal learning environments stem from several conditions.

First, as we move into an increasingly complex, knowledge-based society it is abundantly clear that what is learned solely in schools is insufficient to prepare youth to function in that society. For preschool to grade twelve students, the learning that takes place in nonformal learning environments is proving to be a powerful, perhaps necessary, supplement to the curriculum.

Second, the shortcomings of the depth and breadth of the curriculum found in schools (the “what” that is learned) are compounded by the way (“how”) things are learned in school. That is, the structure and function of classroom-based learning communities are generally not representative of the way real-world learning communities function and operate. Despite repeated calls for reform, learning in schools generally remains an isolated activity. The content learned in classrooms is often decontextualized. Yet we know that meaningful learning is nestled in social situations and authen-

tic contexts. In addition, research into the sociology of scientific knowledge as well as artificial intelligence contributes to a conception known as “distributed cognition.” Most simply, the notion of distributed cognition describes the interactions, interdependencies, and coordination of actions that take place among individuals within a learning organization such as a small, scientific community of inquirers. The organization and structure of classrooms often do not promote the type of positive interdependency reflective of inquiry communities.

Lastly, as we move into a more technological, science-based, knowledge-based society and as the local and global economic forces erase our notion of one life-long vocation, the need to retrain the workforce is increasingly necessary. Research has demonstrated that the models of teaching and learning found in schools are largely inappropriate for adult learners. Nonformal learning environments, therefore, are proving to be very fertile ground for research in the development of adult cognition and adult learning.

The relatively recent yet rapid growth of research in nonformal learning environments has resulted in some confusion and perhaps controversy regarding the use and meaning of some expressions closely associated with the topic. Consequently, the basic terms connected to the research must be introduced and defined. The first term is “formal learning environments.” Formal learning environments refer to places such as classrooms in which (1) attendance is usually compulsory, (2) learning is directed by a teacher, (3) the content and processes of teaching and learning are typically constrained by a curriculum, and (4) the nature of social interaction is largely hierarchical. Both curriculum and instruction in formal learning environments have a long, rich history of criticism. Critics generally argue that the content is usually abstract because it lacks context and real-world connections. The acquisition and accumulation of decontextualized bits of facts, ideas, and concepts are cited as the root cause for the inability of students to apply what they know in new or unfamiliar settings. These failures are most highly associated with the fields of mathematics and science. The utility of science and mathematics is, after all, most deeply connected to their explanatory and predictive powers of natural phenomena.

Whereas the term “formal learning environment” connotes a very uniform or specific, well-defined image for many people, the term “nonformal learn-

ing environment” is broader. As previously mentioned, the gamut of nonformal learning environments ranges from inanimate artificial, technological worlds to live settings like zoos. Because there is such a wide variety of settings and such a wide variety of activities that can take place in those settings, some argue persuasively that it is far more fruitful to focus on types of learning. After all, lectures, often criticized by pundits as an ineffective, didactic, and overly used instructional approach in classrooms, are quite commonly offered for the public by societies, museums, and botanical gardens.

Three broad types of learning—formal, nonformal, and informal—are described in the literature. Although the lines between these can blur, a useful way of categorizing them is the degree to which the learning is goal-oriented, conscious, and directed. In formal learning, teaching and learning activities (cognitive and/or behavioral) target very specific learning outcomes. The learner’s attention to on-task behavior is central to achievement. Also, the instructional approach is usually highly directive.

Though still goal oriented, nonformal learning has more latitude for allowing the learner’s attention to focus on tasks and activities indirectly connected to the goals of learning. In this way, the interest and motivation of the learner are allowed more expression. Furthermore, there may be a less conscious understanding of the outcomes from nonformal learning environments. These outcomes are more likely to be categorized in the affective domain of learning. The opportunities provided for affective learning usually necessitate a less directed nature of learning than found in formal learning, but that does not preclude a fair degree of structure. Lastly, informal learning may be considered a natural form in that it may be more spontaneous and self-motivated/regulated than the other forms of learning. From this simplified perspective, these three types of learning represent a continuum of learning with no definite boundaries. However, the reader is reminded that the ecology of learning is complex and, therefore, any theoretical framework that attempts to delineate types of learning is inherently reductionist in nature. In fact, contemporary conceptions of knowledge (the product of learning) are, in part, a consequence of dissatisfaction with reductionist views on knowledge.

John A. Craven

INFORMAL LEARNING AND DEVELOPMENT

For young children, much of their cognitive, social, and moral development results from their interaction with the environment. Many of the everyday and spontaneous interactions in which children are engaged are informal, and a number of these informal childhood engagements have been labeled as play. In Margaret Lowenfeld's (1991) book *Play in Childhood* a variety of classifications and functions of play are identified. For example, play is viewed as a bodily activity, repetition of experience, demonstration of fantasy, realization of environment, and preparation for life. In some venues, play has even been defined as the work of children. It is clear from the literature that play encompasses a plethora of activities. However, when analyzing the examples of children's play, two common factors appear: active involvement and self-directed behavior.

SOCIAL DEVELOPMENT THROUGH PLAY

Play for children is the renaissance of their overall social development. It provides them with a stage to express their developing social orientations of moral development, social connectiveness, social affiliations, cognitive development, and nurturing behaviors. Play provides an accepted avenue to escape adult control and develop social interaction experiences. According to well-known theorists and researchers like Margaret Mead, Jean Piaget, and Lev Vygotsky, play provides the foundation of social development during the early school years.

For Annemarie Roeper (1988), "play and exploration remain the best learning tools for the young child. Children develop a sense of inner freedom and permission to reach out if they (and their goals and idiosyncratic ways of learning) are supported by the adults at the school. This security and freedom requires a flexible atmosphere with much opportunity for discovery, individualized and group learning, play, and stimulating enthusiastic adults who are learners themselves" (p. 133). It is apparent that play serves an important cognitive function for young children. Through play, the child interacts with his or her environment and increases cognitive and social awareness.

Further, research in the area of neuroscience supports the notion that a child exposed to an enriched environment will have a greater opportunity to develop more complex synaptic connections in the brain.

Piaget observed children at play and identified the different types of learning experiences that are acquired while participating in play. Games as informal learning events have a major significance for Piaget's position on social, cognitive, and moral development during childhood. From play emerges the opportunity to engage in a rich variety of social interactions. Basic to any affiliation with a group is the learning of the rules that permits the group to function. The politics of play requires one to learn how to follow rules, to understand how rules can be made, and to learn how rules are changed. The importance of learning the rules of the game were mentioned by Piaget: It was noted that boys were seen quarreling all the time, but not once was the game terminated because of a quarrel and no game was interrupted for more than seven minutes. In the gravest debates, the final word was always to "repeat the play," generally followed by a chorus of "cheaters proof" (Lever 1976, 482).

For both Piaget and Janet Lever, boys' games are engulfed with elaborate legal rules that provide the opportunity to practice adjudicating conflicts. In contrast, the occurrence of disputes in games for girls seemed to signal the end of the activity. Like Piaget, Lawrence Kohlberg (1978) emphasizes the importance of play in teaching object lessons. He asserts that the act of role taking in conflict resolution is more readily available to boys through their system of games than it is to girls. This is a crucial point for sex differences in moral development according to Kohlberg's theory.

Piaget's (1932) work sustains Kohlberg's theory of moral development and indicates that girls are more "pragmatic" in their attitude toward games and rules, "regarding a rule as good as long as the game repaid it" (p. 83). Carol Gilligan (1982) states that "girls are more tolerant in their attitude toward the rules, more willing to make exceptions, and more easily reconciled to innovations" (p. 10). Marked differences occur when young boys and girls are questioned for their opinions about how the members of the opposite sex engaged in activities involving games. Boys complained that girls did not play rough games but preferred to jump rope or play with dolls. Girls who do prefer to be active or to participate in more muscular activities are viewed as loners or tomboys with little group sup-

port for their preference, even at young ages (p. 13). Lever (1976) provides credence to this notion when she reports that boys tend to play in large heterogeneous groups, that their games are more competitive, that they play outdoors more often than girls, and that the duration of the games for boys is often longer than the games for girls. It should be noted that this view may be changing somewhat with the increased popularity of organized sports for young girls such as soccer, basketball, and volleyball.

MORAL DEVELOPMENT AND PLAY

There are disparate informal learning experiences that are provided to young girls and boys through play. Kohlberg (1978) believes that the moral lessons learned by girls through the games they play are vastly different from those learned by boys. For Kohlberg, girls' games offer a sense of fairness through take-a-turn type of activities. The games are generally played in a noncompetitive arena, with cooperative efforts to achieve equal success for all. Girls appear to prefer noncompetitive games, do not enjoy seeing another's failure, and appear to place a greater value on the continuation of a friendship.

According to Kohlberg (1978), moral development is learned by being actively involved in situations requiring the resolution of a conflict. The traditional types of activities that girls play, and the manner in which they conduct the activities, provide less of an opportunity for controversies to develop and active moral development to occur. Their orientation toward play and the nature of their games leaves girls with fewer disputes to settle and less of an opportunity to develop adjudication techniques.

Contrary to Kohlberg's (1978) theory of moral development, Gilligan (1982) states that girls have a different moral psychology from that of boys. Girls and boys occupy separate spheres of reality as a result of differential socialization. Girls' moral psychology stresses an ethic of caring for other people. The concept of caring responsiveness for people is fostered from the socialization process as explained by Nancy Chodorow (1978). It is an informal process transmitted by modeling appropriate behaviors. Gilligan (1982) suggests that through varied experiences, boys and girls develop different cognitive schemas for justice and legal rights. Girls do not argue over rules or develop elaborate rules for games

because the rules are unimportant. Girls value interdependence and mutual support in activities rather than competitiveness and independence.

PLAY AND THE DEVELOPMENT OF ACADEMIC-RELATED SKILLS

Roeper (1988) stresses that play goes beyond social development and enhances subject-related knowledge. She provides specific examples to demonstrate the importance of play as an informal activity in learning science-related skills—a formal endeavor. The literature provides a variety of studies suggesting that informal play experiences of boys may be more advantageous for the acquisition of academic skills. It appears that girls may be at a disadvantage in science due to their failure to acquire the type of skills obtained by boys informally through play and interests. Gerda Siann (1977) demonstrates that a variety of play experiences have a high correlation with the selection of science courses. It is evident from Lever's (1976) analysis that many of the games that boys play foster the development of independence and organizational skills. Her research indicates that boys' games provide them with an outlet to compete with both friends and enemies in a socially accepted manner. This is a skill that is invaluable in later life.

Other studies note that the divergent lessons and experiences that are obtained through differentiated play affect future science and mathematics achievement, interest, and attitudes of young children. In addition, much has been written in regard to certain child-rearing practices that may fail to produce competent and self-confident individuals. Unfortunately, evidence suggests that boys and girls are not treated equally either by their parents or their teachers. The aggregate effect of these studies highlights the importance of informal learning experiences as they relate to human development.

THE IMPORTANCE OF PLAY

In summary, the importance of play as an informal learning activity for young children cannot be overestimated. Play has even been characterized as the work of children. The activity known as play can occur in a variety of settings as long as children display active involvement and self-directed behavior. The abundance of activities that embody play af-

ford children a medley of opportunities to develop social, moral, and academic-related competencies. It has also been noted that distinct patterns of socialization, interaction, and interpersonal experiences exist for young boys and young girls. Many of the studies allude to the idea that the differentiation in young children's informal experiences influences such things as future social formation, academic achievement, career choice, and moral development.

Stephen J. Farenga

THE DEVELOPMENT OF SCIENTIFIC THINKING FROM INFORMAL ACTIVITY

Scientific thinking refers to the processes involved when an individual bases a conclusion of a statement, activity, or group of tasks on any form of evidence. This evidence is usually provided within a continuum, which ranges from casual observation on one end of the continuum to the results based on a collection of data on the other. Scientific thinking can take the form of empiricism, whereby the individual thinking scientifically bases a conclusion either on the appearance of a phenomenon or on the behavior of data collected for observation. It can also take the form of experimentation, whereby data are collected from two or more groups, one of the groups controlled (without change or modification of variables), and the other experimental (with change or modification of variables). Scientific thinking does not, however, deal with specific content. The term is often misconceived and even distorted when associated with organized disciplines that can be organized under the umbrella of "science" (e.g., biology, geology, physics, chemistry).

DEVELOPMENT OF SCIENTIFIC THINKING

The question of how children develop scientific thinking from informal everyday experiences has been investigated by educational researchers, developmental psychologists, and science educators.

Investigations conducted in both laboratories (clinical interviews) and field-based settings (museums, zoos, aquariums, science-related centers) have fostered an understanding of the importance of effective learning environments. Present in the literature is an emerging paradigm stressing the fundamental importance of socially embedded activities to the development of scientific thinking. The research suggests that these environments, coupled with appropriate adult interaction, foster the acquisition of content knowledge, inquiry skills, and positive attitudes (interest and habits), required components of scientific thinking.

The importance of early informal experiences for the development of eminent scientists was examined by Anne Roe (1953). Inferences made from Roe's research suggest that the specific nature of these informal experiences supports the development of skills, concepts, and attitudes required for scientific thinking. Physicists in her study reported early extracurricular interests that appeared to relate directly to future career interests. As children, these scientists reported that they played with physical gadgets, worked with electricity, constructed erector sets, and enjoyed experimenting with various objects. In contrast to the physicists, the biologists did not report as strong an early interest in informal science-related activities. However, some reported an early interest in topics classified as natural history and some an intense interest that included field studies with the keeping of field notes.

It is believed that providing children with experiences suited to their abilities will enable them to develop cognitively. Everyday experience is necessary in fostering conceptual change and the development of scientific and mathematical thinking. It is suggested that with appropriate experience, a transformation from one form of thinking to another will occur readily. This transformation occurs when the individual's informal understandings are linked with scientific meaning. For example, a preschool child might determine the number of blocks needed to form the sides of a rectangular structure. If three blocks cover one of the sides, the child might conclude that 12 blocks in all (four sides of the structure) are needed to enclose the structure. However, the child may not necessarily encounter the formalization of multiplication until she completes two or three years of formal schooling. Theoretical models were developed

to explain how conceptual change occurs.

Edwin Arthur Peel (1967) supplies an interesting example demonstrating how a child might progress from concrete operational to formal operational thinking. In Peel's scenario, a child, who has a model electric train set powered by a transformer, finds that the train will not run when everything is appropriately connected. The child who functions at the concrete operational stage uses a trial and error method to solve the problem. The child tries one method after another until a solution is found. Over the course of time, when this inefficient method has been outgrown, the child's thought concerning the possible outcomes in the situation will precede action. At this point, the child will check the plug, transformer connections, switch the gear, and the rail fittings. It is apparent that the child has begun to eliminate one variable after another while the remainder of the variables is held constant. The situation begins to formalize scientific thinking. The child identifies possibilities, formulates hypotheses, and begins to solve the problem (see Ennever and Harlen 1972).

INFORMAL SCIENCE AND MATHEMATICS

Researchers in the fields of cognition and education argue that informal science and mathematics include basic perceptions that form the basis of empirical and quantitative inquiry, such as understanding broad concepts like more and less (relative amount) or the location of objects. Cognitive scientists and educational researchers have also posited that human beings possess an underlying biological propensity to engage in activities that involve proto-mathematical or scientific ideas (Farenga, Joyce, and Ness 2002; Ginsburg 1989). The idea that members of all cultures distinguish between the concept of more and less supports the notion that the concept is not culturally bound. It includes principles of counting that on one view develop from "skeletal" biological structures (Gelman 2000). Informal mathematics also includes "informal" ideas like "adding makes more" (Brush 1978) that may develop from experience in manipulating objects or observing events. It also includes culturally derived acquisitions, like the counting words, and even "formal" skills, like writing conventional numbers.

Mostly, informal mathematics is untaught; adults are usually unaware of its existence (apart from simple counting and recognition of plain shapes). However, sometimes parents do teach young children mathematical ideas and reinforce children's spontaneous attempts to deal with mathematical issues (Anderson 1997; Saxe, Guberman, and Gearhart 1987). In addition, a large number of pre-schools and kindergartens offer mathematics and science curricula for a number of their students.

In sum, informal science and mathematics deal with the scientific and mathematical activities that young children acquire during their daily routines. Moreover, young children are afforded these informal cognitive activities depending on the social and physical environment. Researchers have demonstrated that four- and five-year-old children engage in a considerable amount of informal science and mathematics, often during free play. Their involvement with patterns (placing a sequence of objects in a rule-governed manner), magnitude (comparing the height of two or more objects or people), enumeration (counting objects, calculating, or determining cardinality), and spatial activities (creating two- and three-dimensional structures, drawing, using words having to do with place or location) have been frequently observed. Children have also been observed to demonstrate knowledge in classification activities (sorting objects by color, shape, or size) and dynamic processes (creating a situation in which an object changes motion or appearance, for example rolling a ball or toy car from the top of a slide, thus creating a change in motion). The acquisition of young children's informal scientific and mathematical knowledge as a constructive process is preceded by a biological propensity to learn, one's physical and social environment, and one's cultural background. The evidence which supports a biological underpinning for the learning of scientific and mathematical ideas, and the importance of social and physical environments which support learning are two conditions which contribute to the universality of human knowledge in the areas of science and mathematics. Moreover, these conditions foster young children's spontaneous scientific and mathematical inquiry (and interest) in diverse cultural settings.

Stephen J. Farenga

A REVIEW OF INFORMAL EXPERIENCES ON ACADEMIC ACHIEVEMENT

Informal learning for many students occurs within the community, which is comprised of families, peer groups, businesses, and schools, as well as religious and governmental organizations. Each of these community agencies can employ a variety of methods (i.e., independent/dependent, implicit/explicit) to provide informal learning opportunities that transmit cultural messages and affect achievement. The theory of social constructivism supports the claim that knowledge is the product of the interaction between social groups and their practices. The foundation of social constructivism is embedded in Immanuel Kant's idealism, which reflects the notion that people cannot know things directly, and that knowledge of the world is only possible by providing prior definitions. Contemporary constructivists question Kant's *a priori* construct of the world by claiming that there is no uniform definition of categories. For this group of theorists, knowledge is relevant only to a specific period of time or cultural group. Under the paradigm of social constructivism, it is difficult to evaluate ideas and constructs. No independent standards exist, since social constructivism tends to lean more toward relativism—perspectives of truth and morality are not absolute; instead, they are relative to the individuals or cultures holding particular beliefs. Earlier research studies emphasized the role of formal learning environments, such as schools, colleges, universities, and technical agencies, which stressed the absolute nature of knowledge in their relationship to academic achievement. Within these formal settings, achievement was generally measured in relationship to the personal attributes of the student (e.g., intelligence, maturation, motivation, gender), teacher characteristics (e.g., teaching style, gender, intelligence), the school's environment (e.g., homogeneous by gender, ability grouping, school size, student centered), or some combination of these achievement-related variables.

Recent reports have focused on the influence of environmental factors external from formal settings. Further, theoretical models have been developed to

explain the effect of the overlapping influence of the entities in the community. Epstein and Sanders (2000) discuss the importance of the theory of overlapping spheres of influence. They state, "The theory integrates and extends several ecological, educational, psychological, and sociological perspectives on social organizations and relationships" (p. 287). The theory suggests that community members who come into contact with children have a shared responsibility for their development. Key to the functioning of this model is the common responsibility for communication and respect among individuals and agencies involved in the community. The theory changes our understanding of the interaction of family, school, and community from one of sequential development to one of simultaneous influences from childhood through adulthood. These overlapping spheres of influence supply an active context for James Coleman's concept of social capital (1988). The more efficient the community agencies function and interact, the greater the chance of increasing the social capital in the community.

According to demographic data, communities may be characterized by socioeconomic status, level of education, race, ethnic composition, or other descriptions. The research suggests that more than anything else, socioeconomic status (SES) may predict additional characteristics of the neighborhood. Gary Orfield, Mark Bachmeier, David James, and Tamela Eitle (1997) report that SES not only categorizes a neighborhood economically, but also by race, ethnic background, and available opportunity. The combined contribution of all the factors in a community contributes to the culture and the social capital of that community. Culture might be defined as the products, social interactions, and the ideas of a particular group. Two or more cultures may vary on a number of measurable factors. One such factor is the degree to which individual or group efforts are valued. According to Elise Trumbull, Carrie Rothstein-Fisch, Patricia Greenfield, and Blanca Quiroz (2001), "The continuum of individualism/collectivism represents the degree to which a culture emphasizes individual fulfillment and choice versus interdependent relations, social responsibility, and well being of the group" (p. 4). The cultural contrasts between the views of individualism and collectivism create two different social learning environments. "Children

socialized in an individualistic orientation are attuned early on to learning about physical objects in the physical world as a way of facilitating independence. . . . Learning how to manipulate toys is also the beginning of what might be called 'technological intelligence' " (Trumbull et al. 2001, 9). Language in the individualistic orientation is used to mediate interaction, control behavior, and provide the child with additional instruction. In the collectivistic culture, "Holding, touching, and modeling how to carry out a task (rather than direct oral language) tend to be the dominant form of communication between parent and child" (p. 9). Each culture (individualistic or collectivistic) demonstrates how identical samples of behavior can foster different levels of cognitive development based on the cultural context in which the behavior occurred. Trumbull and her colleagues' message urges us to consider the culturally different ways knowledge may be constructed. If language is decontextualized from the related experience, it may create an ambiguous situation, thereby limiting understanding.

It is essential to understand the influence of informal learning experiences on formal development. A broad body of research has begun to focus on the resources available in a community and students' opportunities and potential achievement. Drawing from a variety of disciplines, sociology (Epstein and Sanders 2000), developmental psychology (Piaget 1952; Vygotsky 1978), science education (Farenga 1995; Farenga and Joyce 1997; Marjoribanks 1991; Midwinter 1975), and mathematics education (Ness 2001; Saxe, Guberman, and Gearhart 1987), the importance of informal experience in transferring culturally vital information should not be underestimated (Brown, Collins, and Duguid 1989). The implicit experiences learned in the community transmit object-related lessons on equality, civic responsibility, democracy, and other forms of cultural literacy. The experiences one has in a community can foster an awareness of rights and responsibilities as a member of a variety of groups (i.e., religious, ethnic, school).

In most communities, by attending public schools, children realize that they belong to a nation of immigrants and live in a multicultural society. It has been suggested that the manner in which one balances individual cultural literacy with an understanding of the larger community may determine one's academic success. E. D. Hirsch (1983, 1985) states

that students who possess knowledge about references and symbols of the "mainstream" culture tend to have higher achievement levels than students who do not share in that knowledge. Out-of-school educationally related activities provide children with increased advantages if the experiences gained from the activities are recognized and valued by the school. Stephen Farenga and Beverly Joyce (1997), Jane Kahle (1990), and Luis Moll, Cathy Amanti, D. Neff, and Norma Gonzalez (1992) suggest that everyday activities foster skills and knowledge related to more formal learning. Laurence Steinberg (1996) has a somewhat different reason for student achievement. He suggests "that the sorry state of American student achievement is due more to the conditions of students' lives outside of school than it is to what takes place within school walls" (p. 184). Steinberg identifies numerous factors beyond the classroom in the informal community environment of the students that contribute to poor academic performance. In general, he identifies: (1) "the high prevalence of disengaged parents"; (2) "the contemporary American peer culture that demeans academic success and scorns students who try to do well in school"; and (3) "activity schedule[s] that demand little academic energy from students when they are not in the classroom and permits students to devote excessive amounts of time to socializing, part-time employment, and a variety of leisure activities" (pp. 187-188). Steinberg emphasizes that it is an attitude factor that hinders achievement. The reason for poor performance on high-stakes tests and other international comparisons of achievement has to do with the limited amount of hard work and not the innate ability of the American student. Therefore, school reforms such as an increase in academic standards, reorganizing schools, or instructional changes would make little difference in academic achievement without a modification in society's attitudes (Steinberg 1996).

An alternative view to school reform requires an examination of informal learning environments within a community. Creating equality in education requires that we look beyond the formal setting of the classroom and school to the environmental press of the informal setting involving the family and the community. Some communities may not have the appropriate resources to promote students' intellectual and social development. It has been demonstrated that parents of different socioeconomic status often

have different childrearing practices that may impact their children's learning. David Baker and David Stevenson (1986) report that parents with formal educations and higher socioeconomic status are more likely to be involved with their children's education than parents from a lesser socioeconomic status. The literature is replete with reports that substantiate the link between students' family economic attributes and students' achievement (Caldas and Bankston 1999; Coate and VanderHoff 1999; Cohen 2000; Sutton and Soderstrom 1999; Watts 2003). Elizabeth Cohen (2000) states: "One of the oldest, most reliable findings in sociology of education is the relationship between socioeconomic status of a family, race, ethnicity, and academic achievement" (p. 274).

The construction of a combined variable to represent home and community has been discussed in the literature and used in research as predictor variable for school achievement. Certain studies have employed a poverty index as a combined measure of the cumulative influence of the home and community. When poverty is endemic throughout a community, the resources including social capital available to the individual or family can be in limited supply. In prior research, the variables of home, school, and community were considered as separate entities. Research questions generally decontextualize each one of the variables to avoid interaction effects. Little consideration was given to their combined contribution and overlapping influences. The research from James Coleman (1988), J. Ward Keesling and R. J. Melaragno (1983), and Joyce Epstein (1990) have each demonstrated how the home, school, and community may interact to determine formal educational outputs of students. In essence, these and other studies suggest that the informal experiences of the home may be responsible for the formal achievement in school.

Research that examines the effects of environment, experience, and brain development provides additional perspectives for the consideration of the relationship of informal experiences on human development (Bateson 1979; Greenough, Black, and Wallace 2002). The experience-expectant explanation proposes that critical times exist to pair naturally occurring environmental stimuli with the appropriate maturational readiness of the organism. These naturally occurring environmental experiences supply the required stimuli for the development of sensory organs and the brain. Timing the experience with the

readiness period is paramount, and may provide some adaptive value to the organism. Research identified that brain formation has sensitive periods in which sensory-system deprivation negatively affects the development of the modalities (Feng and Rogowski 1980; Movshon and Von Sluyters 1981). These studies indicate that there are definitive periods in which natural environmental experiences need to be present in order for the proper development and future functioning of the sensory organs. The experience-dependent explanation involves the storage of environmental information that is uniquely experienced by the individual. This information may be available in the environment at any time. However, the individual must be ready to act upon the stimuli and integrate it through the formation of new synaptic connections. These connections form in response to the stimuli in the environment. The quality of the environmental stimuli may be the critical component of early enrichment in child development. Also, what appears to be more critical than enrichment is deprivation. Research provides more detailed explanations of the negative impact of deprivation, but does not provide specific formulas for the levels of enrichment that foster increased cognitive development (Gopnik, Meltzoff, and Kuhl, 1999). An important aspect of informal learning experiences may therefore be related to the experience-dependent explanation for the storage of information that is specific to the individual. The experience-dependent explanation for the storage of information is affected by the unique experiences of the individual. If the individual has a deficit of informal learning experiences that provide a myriad of problem-solving situations, the brain may have limited opportunity to develop neural networks as a response to the complex behaviors.

Stephen J. Farenga

PERSONAL AND PROFESSIONAL GROWTH

We live in a very dynamic, fluid society and advancements in science, technology, and communication are exerting powerful, inexorable forces that are continually shaping and redefining the roles of

individuals and groups in the broader community. To a large extent, these forces are also rapidly changing the skills and knowledge needed to survive and thrive in this global, knowledge-based society. At the same time, our society is placing great value on performance and outcomes. Consequently, many professional and educational organizations have generated lists of “competencies” to serve as learning frameworks for their institutions. The competencies are frequently described collectively in terms of scientific, technological, and informational literacy. Literacy in these critical areas is widely regarded as a requisite characteristic of an individual well equipped to contribute to the economic, environmental, and health-based stability of one’s local, national, and global community. Rapid advances in knowledge and skill bases create the need for cognitive retooling. Further, the list of competencies is increasing in number and complexity. Consequently, the current movement in education emphasizes the preparation of life-long learners as a critical goal in human development. In a broad sense, life-long learners have the knowledge, skills, and the habits of mind for ongoing, sustainable, self-regulated learning in personal and professional domains. Whereas formal educational systems focus largely on training and education at the initial level, nonformal learning environments represent practical pathways to the personal and professional development of the adult learner. Currently, chief among the nonformal environments are those found in the electronic realm such as the Internet, virtual reality, television, and other digital environments.

Unlike most formal learning environments, the Internet provides learners with opportunities to pursue interests, access information, collaborate with others, and engage in cognitive processes typically associated with active, involved, life-long learning. The Internet’s capacity to connect learners by bridging learning communities over barriers of time and distance makes the medium one of the most ubiquitous forms of personal and professional development for adult learners. What once may have been considered a supplemental boon to the formal educational environment (school classroom), the Internet may now be considered a threat because it is increasingly supplanting rather than augmenting traditional instructional approaches. At the very

least, the Internet has become the conduit for powerful alternatives to formal educational environments. Even a cursory search on the Internet yields an enormous number of vehicles for personal and professional development. They range from chat rooms for people with similar interest and hobbies to virtual universities offering terminal degrees in advanced subjects.

Educational researchers are in the early stages of understanding the developmental needs of adult learners in informal learning environments as they are related to ongoing improvement of knowledge and skills for personal and professional development. Yet the economic and social consequences for failing to enhance informal learning environments for continuing education and the growing recognition that formal learning environments alone cannot satisfy the needs of tomorrow’s life-long learners are evident in the educational community. Governmental agencies in nations around the world are addressing the issues and concerns relating to the expanding need for continuing education for the professional growth of its citizens. For example, the Norwegian Institute for Adult Education recently released its longitudinal study into the validation of nonformal and informal learning in Norway. The study, *The Realkompetanse Project* (1999–2002), was designed to “create a national system for the documentation of adult’s nonformal and informal learning, with legitimacy in both the workplace and the education system” (Kjølseth 2002). The project represented part of the national workplace and educational reform system aimed at meeting the needs of the broader population to develop skills for the workplace and society. Norway’s efforts to understand, support, and enhance adult learning in informal learning environments resonate with those of many other countries. Similar national programs are found in the Philippines, Australia, Canada, Germany, and Greece, among others. In a more collective approach, the European Training Village (www2.trainingvillage.gr/etv/nonformal/index.asp) presents an electronic forum for constituents of European nations dedicated to professional development, vocational training, and promoting lifelong learning.

Given what is now known about the brain, how people learn, and the cognitive activity required for in-depth, meaningful learning, the educational

experiences created through the Internet not only challenge our notions on the role and viability of traditional approaches to education, but also offer new insights into the processes of learning itself. There is a growing body of research in the domain of information technologies and cognitive processes such as problem solving, cognitive visual spatial reasoning, selective attention, concept formation and acquisition, and knowledge representation. And, as technological advancements continue, the oppor-

tunities to explore aspects of human learning within digital environments become richer and more accessible. Collectively, the recent advances in artificial intelligence, explorations into situated learning and distributed cognition, and broader views of developmental theories pose ever-greater challenges to our current theories of learning, epistemology, inquiry, and human growth and development.

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TECHNOLOGIES IN EDUCATION

Before the twentieth century, the three primary means of instruction were the teacher, the textbook, and the chalkboard. For most of the twentieth century, this remained largely true, with print media the predominant technology in education. Books, paper, pens, and pencils were the fundamental means for accessing, communicating, and otherwise sharing information. While many would argue this is still true today, technology's increasing influence and impact on education cannot be doubted. Since the turn of the century, teachers have used a variety of audio and visual aids to supplement instruction, including film, radio, slides, recordings, and the overhead projector. During the last twenty-five years, educators and schools have made increasing use of new technologies including computers, communication networks, and digital media. While the history of the early technologies is not ignored, this chapter focuses on these newer technologies. Some important terms must be addressed before this discussion. Instructional media means supplementary items used for educational purposes beyond the teacher, textbook, and chalkboard. In fact, in the United States, instructional media were first called "audiovisual aids," which reflected their use as supplements or aids for the instructor. Two more recent terms, instructional technology and educational technology, include instructional media but emphasize the learner rather than the technology. Educational technologies are not single technologies but complex combinations of hardware and software. These technologies may employ some combination of text, audio, video, and computer code, with the resulting content delivered locally or across great distances. Although technological applications are frequently characterized in terms of their most obvious hardware feature (e.g., a VCR or a computer), from the standpoint of education it is the nature of the instruction delivered and the learning accom-

plished that is important rather than the equipment delivering it.

Perhaps the first use of instructional media can be traced to the school museum, a collection of exhibits, maps, photographs, lantern slides (forerunner to the slide projector), study prints, and other instructional materials. A catalog of materials allowed teachers to request specific items. The first school museum opened in St. Louis in 1905, and soon after others appeared in Reading, Pennsylvania, and Cleveland, Ohio. Horsedrawn wagons and then trucks circulated materials to local schools. These museums served much the same purpose as today's school and school district media centers. The majority of the items displayed in these school museums were visual media. Projection devices included the magic lantern (a lantern slide projector) and the stereopticon, a single-user device for viewing stereographs, or three-dimensional photographs. This 3-D view is actually two images mounted side by side. Each picture was taken from a slightly different viewpoint corresponding approximately to the spacing of the eyes. When seen through a stereopticon, the left eye sees only the left photograph and the right eye its corresponding half, thus forming a stereoscopic or three dimensional image.

The increasing interest in visual materials led to the visual education or visual instruction movement. New York state founded the first visual instruction department in 1904, and the first catalog of instructional films was published in 1910—the aptly named "Catalog of Educational Motion Pictures." These early instructional and trade catalogs included industrial, travel and scenic films, sports and acrobatic subjects, dances and ballets, military and historical stories, fairy tales, as well as religious and biblical topics. It was not until the late 1920s that clear distinctions began to be made regarding films for entertainment and films for instructional purposes, and

that sound began to appear in greater numbers of motion pictures. Thomas Edison, who once believed films would replace books in schools, published his own catalog of instructional films. His first production was a series on the American Revolution and he went on to develop several scientific and historical films. The burgeoning interest in visual media led to the formation of visual instruction departments at universities, which later became audiovisual or media science departments.

The addition of sound to motion pictures was not the only experiment with sound for instructional purposes. During the 1920s, both commercial and educational radio stations began broadcasting to classrooms as the U.S. Office of Education promoted the use of radio instruction. Much of this early educational programming consisted of classroom lectures. The Ohio School of the Air, launched in 1929, was a cooperative venture between Ohio State University and a Cincinnati radio station, and was broadcast to schools and homes. In California, schools broadcasted lessons on topics such as writing, math, and history. Public school systems in Cleveland, Detroit, Chicago, Portland, Des Moines, Buffalo, and Rochester also made extensive use of educational radio. Unlike film, which survived the transition from motion picture projector to videotape and VCR, radio's popularity as an instructional tool declined rapidly, and by 1940 had been largely abandoned.

World War II played a significant role in the development of the field of instructional technology. The U.S. government produced several hundred training films, and purchased more than fifty thousand projectors to view them. Other technologies that were used extensively included slide projectors, audio recording and playback equipment, equipment simulators, and the newly invented overhead projector. Training manuals and other materials were developed to guide instructors and students in the use of these films and other instructional aids. Mediated instruction gained new prominence, as research programs emerged to identify principles of learning as well as effective audiovisual development and instruction. However, this research had little influence on school practice because reports were not widely available, and many educators were either unaware or disinterested regarding the findings.

As previously mentioned, the overhead projector emerged during this time as an important training

tool, one now widely available in contemporary classrooms. The overhead projector is today the dominant projection device in schools for numerous reasons. It is a simple and versatile device, easily used with learners of all ages. Prepared transparencies often accompany textbooks or they can be quickly made, and they allow for controlled disclosure of information. Perhaps most importantly, teachers can maintain eye contact with students to monitor instruction and facilitate classroom management.

The 1950s began a period of tremendous interest in television as an instructional medium. Federal Communications Commissioner Freida Hennock led the effort to reserve space for educational television (ETV). In 1952, the Federal Communications Commission set aside 242 channels for educational television. KUHT in Houston, Texas, was the first noncommercial television licensee. By the 1960s, there were over fifty such stations. The mission of these educational television stations was to present instructional programming, primarily formal classroom instruction and enrichment. The dominant model was based on talented teachers delivering lectures that would then be broadcast to classrooms, where local teachers would deliver individual instruction to supplement the lectures. Educational television was continually plagued with financial problems. As a noncommercial enterprise, ETV needed to rely on outside sources for funding. Private foundations, such as the Ford Foundation, contributed millions of dollars in support. Estimates of the Ford Foundation's total contributions range between \$170 million and \$300 million. Projects sponsored by this foundation included a closed-circuit television system throughout the Washington County Schools in Maryland, college courses taught via closed circuit TV at Pennsylvania State University, and the Midwest Project on Airborne Television Instruction. The 1962 Educational Television Facilities Act provided temporary financial relief, with \$32 million federal dollars granted for the creation of educational television stations. However, most projects ended when external funds ran out, or failed due to the low quality and poor pedagogy of the programs.

The establishment of the Carnegie Commission on Educational Television in 1965 was critical to the survival of ETV. For two years the commission researched and analyzed the future relationship be-

tween education and television. In 1967, educational television was officially renamed “public television” to reflect new mandates of the Public Broadcasting Act. Public television would still offer formal instruction (intended for the classroom) in topics such as literacy, mathematics, science, geography, foreign language, and high school equivalency. However, public television would also offer programs intended for a wider audience, with children’s shows as well as informational, cultural, and lifelong learning programming. This is what we know today as public television or the Public Broadcasting Service (PBS).

Today, most instructional television in the classroom takes place through videotape rather than live broadcasts, thanks to the invention of the video cassette recorder (VCR) and the video home system (VHS) tape format. The first VCRs appeared during the 1970s. The concept did not catch on right away, but by the late 1980s it was becoming common technology in homes and schools. The VHS tape has been the most popular format for personal video recordings and video store rentals. However, it is presently being replaced by digital recording and playback media including mini-digital videotape, hard disk recorders, and digital versatile discs (DVDs).

The next wave of educational technology began in the early 1980s when the microcomputer and related hardware and software first appeared in schools in significant numbers. At that time, classrooms began using stand-alone computers from companies such as IBM, Apple, Commodore, and Radio Shack. These systems were variously called PCs, Apple II, PETs, and TRS-80. The first microcomputers had a user interface, or operating system, based on typed words and commands. In 1984, Apple introduced the first personal computer based on a graphical user interface (GUI) using a mouse as a pointing device. The GUI and mouse became the foundation for the Microsoft Windows operating system, and this GUI-based method of computer interaction dominates computing to this day. Educators were attracted to personal computers because they were relatively compact, inexpensive compared to their mainframe ancestors, and perceived as versatile and powerful. Today, nearly all teachers and students have access to personal computers in schools, libraries, or at home.

GLOSSARY OF INSTRUCTIONAL COMPUTING

Computer-based education (CBE) and computer-based learning (CBL) are the broadest terms, and refer to any kind of computer use in educational settings. These uses include drill and practice, tutorials, simulations, instructional management, supplementary exercises, database development, hypermedia authoring, word processing, and other applications. These terms may refer to computer activities that reinforce teacher-led lessons, stand-alone computer-based learning activities, or applications where students have primary responsibility for assembling and presenting content.

Computer-assisted instruction (CAI) was once used much like CBE and CBL, but now is applied in a narrower context. CAI most often refers to drill-and-practice or tutorial activities offered either by themselves or as supplements to traditional, teacher-directed instruction. CAI typically does not require a computer be connected to a network.

Computer-based instruction (CBI) is generally associated with CAI. CBI may be provided by readily available commercial applications or may refer to instructional units developed with authoring tools or authoring systems. These authoring tools allow the development of interactive computer-based instruction without the need to know challenging programming languages such as Pascal or C++. In the world outside education, the result of these programming efforts is often called computer-based training (CBT).

Computer-managed instruction (CMI) can refer either to the use of computers by educators to organize learner data and make instructional decisions, or to activities where students’ progress is monitored, assessed, recorded, and then guided to appropriate instructional resources for review or further development. Most CMI systems also offer the ability to adjust content material for individual students. ICAI or intelligent computer-assisted instruction is similar to CMI. ICAI systems are generally focused on more mathematically oriented domains such as arithmetic, algebra, and programming. ICAI, sometimes referred to as an Intelligent Tutoring System (ITS), incorporates expert

knowledge into an instructional model designed to mimic the behavior of an experienced teacher. Although ICAI is an area of active research, ICAI programs in the schools are not widespread.

Integrated learning systems (ILS) are complete computer-based systems that combine hardware, software, curriculum, assessment, and management in a package available from a single vendor. These systems employ a centralized computer server accessed over local area networks, and generally address basic skills and core subjects across multiple grade levels.

Computer-mediated communications (CMC) refers to the use of networked computer systems and electronic communication systems to support the creation and exchange of information.

CLASSIFYING INSTRUCTIONAL COMPUTING

Early books such as *Mindstorms: Children, Computers, and Powerful Ideas* by Seymour Papert (1999), and Robert Taylor's *The Computer in the School: Tutor, Tool, Tutee* (1980) provided a printed historical context for the earliest applications of computers in the classrooms. In fact, the trichotomy "tutor, tool, tutee" has become a widely used classification system for describing instructional computing software.

Tutor refers to the use of the computer as teacher, presenting instruction directly to students. Tutorial uses are those in which the technology does the teaching and the system controls what material will be presented to the student. Tutorial applications present information and/or display a phenomenon, and then require the student to solve problems, answer questions, or engage in some other procedure to check understanding. Based on the response, the computer then presents new information, offers reinforcement, or remediates. Tutorial applications of computers in education date back to the 1950s, when researchers at IBM designed one of the first CAI programs to be used in schools. Other large-scale systems emerged during the 1960s and 1970s. In 1963, IBM established a partnership with Stanford University and researcher Patrick Suppes to design and develop the first comprehensive CAI elementary school curriculum for reading and mathematics. Suppes designed highly structured computer-based

systems featuring learner feedback, lesson branching, and student record keeping, and helped to set standards for subsequent instructional software. Suppes' work later formed the basis for the educational software company called Computer Curriculum Corporation. PLATO (Programmed Logic for Automatic Teaching Operations) originated at the University of Illinois, and is probably one of the best-known CAI efforts. Looking for ways to use extra capacity on the university's mainframe computer, researchers coupled a discarded television monitor with a primitive keyboard to display slides and computer graphics. Eventually over fifteen thousand hours of PLATO lessons were developed. Today, a descendant of the PLATO system is available for personal computers. TICCIT (Time-Shared Interactive Computer Controlled Information Television) was another major CAI system, developed at the University of Texas and Brigham Young University. TICCIT was originally intended for college students, but another version was later released for elementary schools. TICCIT was one of the first large-scale projects to address learning theory and instructional strategies in the design of the course materials, and among the first to incorporate some degree of learner control. All of these computer-based tutoring systems had three characteristics that distinguished them from other types of audiovisual media. First, continuous, active student response was required. Second, the student received immediate feedback on whether each response was correct, leading directly or indirectly to correction of errors. Third, the student generally worked at his or her own pace. Typical categories of tutorial software found on today's microcomputers are: (1) tutorials, (2) drill and practice, (3) simulations, (4) instructional games, and (5) problem solving.

The most popular way computers are being used in education today is as tools in the learning process, rather than as instructional delivery devices. The computer acts as an assistant, aiding the teacher or student in performing routine tasks. Word processing, presentation software, telecommunications, desktop publishing, database and spreadsheet applications, electronic encyclopedias, drawing, painting, and graphing programs are examples of tool uses. The popularity of tool software is primarily due to the fact that teachers can integrate this software into instruction without making major changes to the

curriculum. Also, these applications mirror the ways personal computers are used in the workplace and at home. Word processors, for example, are generally considered the most widely used tool for personal productivity. Often, tutorial products do not easily match a given course of study or have application beyond a few topics. Tool software is designed to facilitate educational and work-related tasks. Such applications are flexible, lending themselves to a wide variety of activities across the grade levels and throughout the curriculum. This is especially true of computer telecommunications and the Internet.

Computers today are increasingly connected through local area networks (LANs) and wide area networks (WANs). LANs connect computers generally within a given room, building, or campus. WANs cover larger geographical areas. The most extreme example of a WAN is the Internet, a vast collection of computer networks linking millions of computers and hundreds of millions of people. The Internet offers teachers and students unprecedented access to information sources, and the means to communicate with others through electronic mail (e-mail). The most common applications in education are found in electronic mail and information retrieval using the World Wide Web (WWW). The WWW is built on the related concepts of hypertext and hypermedia. Hypermedia describes computer applications that link information elements (text, graphics, audio, and video) in such a way that users can jump easily from one to another. Hypermedia offers an interactive learning environment to be explored by individuals largely choosing their own pathway through the informational elements.

Tutee applications have computers function as the learner, thus reversing the roles of computer and student as seen in CAI. The learner teaches the computer to perform some task. When first introduced, most computers were limited to programming in BASIC, an acronym for Beginners All-purpose Symbolic Instruction Code. The first tutee applications in education likewise involved programming the computer. In most cases, the first computers in schools appeared in mathematics classrooms because math teachers were interested in learning how to program them, and because computers were inherently suited to process numerical information. One of BASIC's descendants, Microsoft's Visual BASIC, is now one of the more popular programs for designing multimedia programs.

Logo is a computer programming language developed by Seymour Papert and others at the Massachusetts Institute of Technology. Logo was the first computer language created for education, specifically, elementary school children. Primarily "log(ically) symb(ol)ic," hence the term Logo, the language allowed users to give simple directional commands to a small, mobile robot tethered to the computer. This robot then drew patterns on paper placed beneath it, using an attached pen. This robot was called a "turtle." This turtle later became an onscreen pointer which children could direct to draw geometric shapes and patterns. The Logo language, while less popular in schools today, is the basis for Lego Logo, a popular toy where youngsters can use Lego building blocks, small electric motors, and the Logo language to construct and control simple machines.

Programming languages such as BASIC, Pascal, and C++ were too complex to be widely useful for teachers and students to develop instructional materials. Authoring languages and tools were developed to fill this gap. However, early efforts such as PILOT, MicroTUTOR, and COURSEWRITER, and later LinkWay and ToolBook, remained too challenging to ensure widespread use. In 1986, Apple Computer included an authoring program with each Macintosh sold. HyperCard was a comprehensive system that used the concept of multimedia, and added a programming language of words and phrases as close to English as anything else previously available on a microcomputer. A single part of an application was called a "card," with the collection of cards comprising an entire HyperCard application called a "stack." Roger Wagner Publishing introduced a similar product called HyperStudio in 1989. Like HyperCard on the Macintosh, HyperStudio used buttons and objects on the screen to direct movement through a stack application, and employed a similar English-based scripting language. Largely due to its ability to run on both Macintosh and Windows platforms, HyperStudio is the most popular hypermedia authoring tool used in K-12 schools.

TECHNOLOGY TODAY

Computers and communications technologies are transforming many sectors of our society. Computing power is more available and affordable than ever before. Digital transmission can deliver instruction

or connect people thousands of miles away. More powerful and less expensive hardware, improved software, multimedia formats, as well as widespread access to the Internet and the WWW, have all contributed to a rapid increase in and use of technology for teaching and learning. However, as with the history of most other media and instructional technologies, increasing quantity and improved access does not necessarily indicate sustainability or quality of application. In reviewing the history of numerous technologies in education, a recurrent theme clearly emerges—anticipated impacts on the teaching and learning process were rarely realized. The great initial enthusiasm for a particular technology fades, as classroom trials and curriculum integration reveal challenges to widespread use and few lasting improvements in teaching and learning.

Studies of instructional uses of technology over the past twenty years have taken a new turn, showing not just whether a technology can teach or how well it compares with conventional instruction (the focus of much earlier media research), but the effects that technology has on what is learned and how it contributes to the learning process. There are enough cases where technology integration has been successful to tell us the effort can be a productive one. However, there are many cases where schools invested in technology that turned out to be poorly used or to be used in ways that merely perpetuated the status quo. From the successes we have learned technology often produces unexpected benefits for students and teachers. From failures we have learned that implementation without thoughtful planning, attention to standards, and sustained support is nearly always futile. Given the widespread impact of digital technology in all sectors of society, and the more thoughtful ways we evaluate its educational effectiveness, computers, the Internet, and other digital media will likely bring about more significant and sustainable changes than the technologies that preceded them.

Andrew J. Brovey and Daniel J. Brovey

TECHNOLOGY INTEGRATION

The Telecommunications Act of 1996 expanded the traditional definition of universal service, that is, na-

tionwide phone service at a reasonable cost to consumers, to include specific benefits to schools and libraries. The act authorized the Federal Communications Commission (FCC) to create a program offering discounts, called E-Rate, to these institutions on telecommunications services such as phone service, network connections, Internet access, and related equipment. The E-Rate and other federal, state, and local funding have been the catalyst for tremendous progress in equipping the nation's schools with computers and Internet connectivity. Over the past ten years the nation has invested some \$40 billion to bring educational technology and Internet connectivity to America's schools. Today, nearly every classroom has one or more computers, and virtually every school is connected to the Internet. Whether technology should be used in schools is no longer the issue in education. Instead, the current emphasis is on ensuring that technology is integrated effectively to promote student achievement and create new opportunities for learning. A review of the literature on integrating technology in the classroom shows that planning, professional development, availability of resources, technical and instructional support, and school leadership largely determine the success of technology integration efforts.

PLANNING

Technology is rapidly emerging as an important component of teaching, learning, and school reform in America. In this case, the term "technology" refers broadly to computer hardware and educational software, computer-based multimedia, and the Internet. These technologies are often promoted as solutions for improving learning before teaching and learning needs are clearly identified. In fact, research consistently shows that technology per se does not improve student learning. Although technology can support educational change, it will have little impact without accompanying planning at the classroom, school, and district level. The research literature clearly shows that careful planning is a prerequisite for the effective integration of technology in education. Numerous educational organizations and professional societies have issued guidelines for technology planning. In general, they agree plans should involve education stakeholders in their design, specify clear objectives related to education goals and

standards, address education and staff development, incorporate “best practices” that have been tested for their educational benefits, and measure results.

With students being held to higher standards and teachers being held accountable for student achievement, educators must demonstrate that learning goals related to technology are met. Evaluation is necessary to gauge the effectiveness of technology integration efforts and must be included in any plan. Preformative evaluation assesses student and educator needs during the planning process. Intended goals are clarified and strategies for gathering data about reaching them are set. Evaluation continues with formative evaluation, which is conducted during integration activities. Formative evaluation provides feedback and determines improvements that can be made during the activity. The evaluation process concludes with summative evaluation conducted after the activity. This part of the evaluation process assesses whether the specific learning goals for students using technology have been achieved or whether there were unintended results. Measures might include grades, scores from standardized tests, and results from alternative assessment such as student portfolio evaluations. Schoolwide indicators might include statistics such as retention, graduation and dropout rates, enrollments in advanced classes, or changes in disciplinary actions. Summative evaluation allows stakeholders to judge the overall merit or worth of the activity and gives decisionmakers feedback needed to remedy deficiencies and improve future plans.

PROFESSIONAL DEVELOPMENT

Ongoing professional development should be an integral part of the school technology plan or overall school-improvement plan. This approach ensures that professional development is considered an essential factor in using technology to improve teaching and learning. A variety of studies indicate that technology will have little effect unless teachers are adequately and appropriately trained. In a report examining the results of over three hundred studies of technology use, J. Sivin-Kachala and E. Bialo (2000), concluded that teacher training was the most significant factor influencing the effective use of educational technology to improve student achievement. Professional development for teach-

ers and technology has two essential components. They are:

1. **Application of adult learning theory or andragogy:** Adults require relevant, hands-on, concrete experiences with adequate support, appropriate feedback, and long-term follow-up. This type of professional development is very different from traditional one-time teacher workshops. Research indicates that teachers learn and incorporate new information best when it is presented over a long time frame instead of a single session. Activities should include a variety of learning experiences, such as mentoring, modeling, ongoing workshops, special courses, structured observations, and summer institutes.

2. **Grounding in Context:** The best integration training for teachers does more than simply show them how to add technology to what they are already doing. Good professional development is job embedded and linked to learning outcomes. It provides activities in the context of practice, demonstrating projects in specific content areas, and helping teachers integrate technology and subject matter. Activities should enhance teachers’ instructional design and assessment skills as well as classroom and technology management abilities.

When asked, teachers are nearly unanimous in concluding that the integration of technology into instruction is a difficult, time-consuming process. Only those teachers who believe technology use will lead to significant benefits for them and for their students will undertake the associated challenges. Individual teachers, like most people, judge an innovation’s advantages and disadvantages relative to their own situation. These situational benefits include flexibility, simplicity, compatibility, profitability, and relative advantage. Teachers are generally not impressed by a device’s technical superiority or the improved speed of delivery it may offer. They do not share the engineer’s penchant for efficiency nor consider themselves technicians who mechanically apply skills, tools, and knowledge to learners. Teachers carefully consider the impact of innovations on the learner, the classroom, and the institution, while simultaneously seeking to satisfy the mandates of government agencies and professional societies.

The dominant use of technology as a classroom

tool initially focused on incorporating general-purpose software that supported traditional activities, tools such as word processors, electronic gradebooks, and presentation packages. This emphasis on adopting general-purpose applications for educational purposes continued with the spread of the World Wide Web and associated software for conducting searches and finding information. Schools are just beginning to explore methods of using computer-based tools to foster meaningful, student-centered learning, including experiences in collaborations, real-world projects, and critical analysis. These instructional changes are closely tied to changes in teachers' beliefs about learning, teacher-student roles, classroom management, and other instructional practices. Studies showed students were less likely to become bored with computers when teachers used technology as one tool among many in their instructional repertoire. In such classrooms, teachers used computers only when they were the most appropriate tool for completing the assignment, not simply because they were available. Teachers who are better prepared to teach using technology and are more knowledgeable about computers tend to use them in a greater variety of ways, and are more likely to have their students use technology in tasks that require higher-order thinking.

Lack of time is the most frequent impediment teachers cite when identifying barriers to technology integration. Teachers need time to design activities, adapt those suggested by others, experiment, and assess results. They need opportunities to discuss technology use with other teachers, whether with near-peers face-to-face, or with colleagues through email, online discussion or videoconferencing. Acknowledging the demands of engaged learning using technology may require the school district to make some adjustments to the school-day schedule, such as longer class periods, more team teaching, and more interdisciplinary work. Helping teachers learn to integrate technology into the curriculum, and giving them time to do so, are critical factors in successfully implementing technology in schools.

AVAILABILITY OF RESOURCES

The technology plan and accompanying professional development cannot occur without a significant commitment of resources by the school district. The dis-

trict must purchase the type of equipment necessary to meet the learning goals identified and provide for ongoing maintenance and upgrading. The technology used for professional development should be the same as the technology used in the classroom, most often a networked computer. Resources should be available to provide teachers with technology they can use at home or in private to become comfortable with the capabilities and challenges it offers. The number and age of the computers also make a difference. Many schools have computers that are obsolete, and it is not uncommon for schools to still be using machines that are a decade old. There are wide discrepancies in accessibility from state to state and from school to school, with high-poverty schools typically having fewer and less capable computers.

Computers can be either in a centralized location such as a computer lab, distributed in the classrooms and media center, or arranged in some combination of the two. Distributing equipment throughout regular classrooms seems equitable, but is likely to have a strong impact only if there is enough technology to give each learning space a critical mass of machines. Placing one or a few computers in every classroom does not appear to be effective. Five to eight modern computers per classroom seems to make technology projects feasible. D. S. Statham and C. R. Torell (1999) suggest that a one-to-five computer-to-student ratio would assure students "near universal access." Results from the long-term Apple Classroom of Tomorrow (ACOT) project confirm the one-to-five ratio as effective. Computers are often concentrated in labs instead of in each teacher's classroom, while Internet connections may be limited to certain designated computers. Internet connectivity with four or more computers was found to be an important factor in predicting whether teachers directed student research involving the Internet (Sivin-Kachala and Bialo 2000). School administrators should ensure that adequate numbers of classroom computers with Internet connections are available to teachers and students, and that access times are sufficient. Researchers have argued that if students are to use computers to be better writers, researchers, and problem solvers, they need to have access to computers when and where they are engaged in these processes.

Jamie McKenzie, a leading observer of computer use in schools, suggests that saturating schools and

classrooms with computers is not necessary (2003). Instead of spreading computers thinly across a building so all teachers have the same number of computers, he argues the most enthusiastic and competent teachers should have the best access. He advocates strategic deployment, placing computers where they are most likely to be used, and moving computers to students rather than students to computers. McKenzie suggests “flotillas” of wireless laptops housed in a mobile cabinet, or computers on wheels (COWs), as two methods to accomplish this. He makes a strong argument for sharing resources through “just-in-time” computing, taking computing resources to a room as needed and removing them for use elsewhere as lessons warrant.

Finally, school administrators and school boards need to consider technology’s total cost of ownership (TCO). They often make the mistake of spending most or all of their technology funds on initial purchases of software and hardware, and overlook the longer-term costs of replacing, maintaining, and supporting computer equipment. Unlike many items purchased for schools, such as library books or physical education equipment, computer hardware, software and peripherals quickly become obsolete. In some schools, printers sit idle because money was not budgeted to replace ink cartridges, toner, or paper. Total cost of ownership should be built into school budgets on an ongoing basis.

TECHNICAL AND INSTRUCTIONAL SUPPORT

Even schools that are well equipped often fall short in providing a convenient and reliable support structure. When teachers are trying to use technology in their classrooms and encounter difficulty, they need immediate help and support. Teachers will return to more traditional forms of instruction if the problems they face cannot be solved quickly and efficiently. Teachers, students and staff need on-site technical support personnel and classroom technology specialists who are responsible for troubleshooting and assistance after the technology and lessons are in place. In a paper discussing the cost, utility, and value of technology, Ellen Wahl (2000) suggests that organizations should spend 30 percent of their budget on equipment and 70 percent on the “human infrastructure” to support ongoing training and technical assis-

tance. Most experts agree that at least 30 percent of a technology budget should be spent on professional development and direct support (U.S. Department of Education 1996). Schools today generally spend less than 10 percent of their budgets in these areas.

LEADERSHIP

Fully implementing a well-designed technology plan requires active involvement of school administrators and leaders. Administrators’ roles in promoting technology integration are primarily related to two factors: modeling and support. One of the most effective ways school administrators can promote technology use is be knowledgeable and effective users of technology themselves. Examples include using email for staff communications such as meeting announcements and minutes. Attendance, grading, and student reporting systems can be computerized. However, careful choices must be made to insure the system chosen is intuitive, practical, and reliable. Also, staff members are more apt to use technology if administrators feel strongly about technology use for legitimate reasons, not merely because they desire to “keep up” with neighboring schools or districts.

Support includes encouraging teachers’ curiosity about what can be done using technology, offering incentives for teachers to attend workshops and conferences, and personal participation in professional development activities to learn firsthand how technology is used and what problems are experienced. School leaders can also foster technology integration by providing time for teachers for planning, collaboration, and implementation of technology-based activities. In general, technology integration is highest in buildings in which the principal is involved and excited about technology, and is lowest in buildings in which the principal doesn’t demonstrate technology use even though he or she encourages others to use it. Modeling and supporting technology use are key if administrators want more teachers to take an active role in applying technology to teaching and learning.

THE INSTITUTIONALIZATION OF TECHNOLOGY

The five conditions mentioned above are present in varying degrees in successful examples of technol-

ogy integration in education. One important conclusion that can be reached is that there is no one formula for a successful innovation effort. Local settings and participants greatly influence the eventual use or disuse of a given technology. The ultimate test of a successful innovation is that it becomes routinely used by those in a given setting, a step called institutionalization. Institutionalization takes place when the innovation forms an integral part of the structure of an organization and changes that organization in a stable way. Though schools and their stakeholders have made much progress on technology integration, they are still some way from making technology an integral and stable part of the learning process.

Andrew J. Brovey and Daniel J. Brovey

NETWORKS AND NETWORKING

NETWORK COMPONENTS

Computer networks are having a tremendous impact on the ways individuals, groups, and organizations connect, communicate, and collaborate. In education, computer networks provide an infrastructure for students, teachers, and schools to explore many new approaches to teaching and learning.

Networks are collections of two or more connected computers. When their computers are joined in a network, people can share files, and peripherals such as modems and printers. In a typical network, one computer will act as a server, a central storage device for files or programs shared over the network. Servers also provide connections to shared peripherals such as printers, and to systemwide resources such as email. Having a dedicated server provides a central point for management tasks such as program upgrades and file backup. The computers that connect to the server are called clients or workstations, and they may have additional software on their individual hard drives. You don't need to have a dedicated server in your network. With only a few computers to connect, networking can be "peer-to-peer." This peer-to-peer network can be used to send email, exchange files, and even use printers con-

nected to just one of the computers. However, when more than a few computers need to share resources, a central server and related networking hardware help to manage the connections, speeding the flow of information and communications.

Computers on a network also require a network interface card (NIC) or network adapter, a device that lets the computer talk to the network. These NICs or adapters are usually installed inside a computer's case. With laptop and notebook computers, the NIC is usually a credit card-sized PC card, which is installed in an external slot, though some models have internal cards. A connection medium, usually a wire or cable, links the devices. Networks use three primary types of cabling: Twisted-pair—Category 5 cable (also called 10BaseT), is the current industry standard in new installations. Coaxial cable, used less frequently, resembles round cable TV wiring. Fiber-optic cable is usually reserved for high-speed connections between "backbone" devices in larger networks, and to connect subnetworks between adjacent buildings or around a campus. Fiber-optic cable is the most reliable and has the highest bandwidth, or carrying capacity, but is also the most expensive.

There are two basic types of networks: Local-Area Networks (LANs) and Wide-Area Networks (WANs). A Local-Area Network is a network that is confined to a relatively small area. LANs accommodate local users and are generally limited to a single room such as a writing lab, a school wing, or a school building. Multiple schools in a district, or several districts within a geographical area may be connected over a WAN. Most schools and campuses gain access to the Internet through some type of remote connection, that is, through an intermediary service. "Remote access" refers to a simple connection, usually dialed up over telephone lines as needed, between an individual user or small office and a central network. Multiple users within a school system or campus generally rely on a device called a router to connect to the ISP, or Internet Service Provider, who then connects the campus to the Internet. In general, LAN speeds are much greater than WAN and remote access speeds.

Like the individual computers on the network that need a software operating system (OS), such as Windows or the Macintosh OS, to work, networks also require a network operating system (NOS) to man-

age network related tasks. Networks also require a protocol for the physical method of cabling that connects devices as well as the standards managing the digital transmissions that make up network traffic. The protocol known as Ethernet is the most popular and most widely deployed network technology in the world. Networks also use electronic devices called hubs or switches to act as centralized signal distribution points between groups of computers that make up the local area network.

WIRELESS NETWORKS

Wireless networking is based on radio transmissions, much like portable phones in the home and cellular telephones for traveling. Early wireless LANs were expensive and relatively slow. The arrival of the 11 Mbps 802.11b standard in late 1999, pioneered by Apple in the easy-to-use AirPort product, was a turning point. This standard and the availability of off-the-shelf chip sets quickly reduced costs. Beginning in 2000, the significantly lower prices, and the wide adoption of standards made the use of wireless networking in classrooms attractive to education. The 802.11b and the newer, faster 802.11g standards allow intercommunication between devices from different manufacturers. Much of the recent burgeoning growth in wireless computer networking can be traced to these two standards. The 802.11b allows several concurrent users to share the bandwidth. It is possible to have twenty to thirty concurrent users, but access speeds may be unsatisfactory unless students are on low bandwidth tasks. The 802.11b, the most common specification, has a top speed of 11 megabits per second (Mbps). The higher speed 54 Mbps products using 802.11g provide higher bandwidths, which means a larger number of concurrent users can comfortably share the signal. You can split the 54Mbps more times than you can split the 11Mbps. The 802.11g is fast becoming the choice for wireless computer networking.

Wireless LAN connections require two different devices. The first is a wireless access point. The access point requires both electrical power and a direct connection to the wired network. About the size of a paperback and sporting a small antenna, it serves as the interface between the wired network and the wireless device, most often a portable computer. This access point acts much like the base station for your

portable phone at home, with the phone base station being the access point to the wired telephone system in your house. The portable computer requires a credit-card sized, wireless PC card to connect to the wireless access point. Internal wireless cards are found in the Macintosh iBooks and Powerbooks, and Centrino notebooks. The growing demand for wireless networking has resulted in Windows-based laptop manufacturers offering better wireless options. Internal cards in laptop and notebook computers typically connect to an antenna built into the notebook lid. When the laptop lid is raised, the higher and wider internal antenna often provides better range than a protruding aerial on a PC card. Though much less common, desktop computers and other devices such as PDAs (personal digital assistants) may also link up wirelessly through the addition of adapter cards. Numerous computers can connect to a single access point but they share the available bandwidth of that device. Access points can transmit up to one hundred meters, though a typical reliable range is generally less than half that, given the obstructions present in typical buildings. Multiple access points allow the user to roam over greater areas, transferring signals from one access point to the next, much like roaming with a cell phone between transmission towers.

Maximum network flexibility is gained by using laptop or notebook computers. Each portable computer can access network software, printers, the World Wide Web, email and other network resources from anywhere within range of the wireless signal. Laptop users can do low bandwidth tasks and stay completely mobile. An average user requires low bandwidth most of the time and wireless networks cope well with low to moderate bandwidth tasks such as those mentioned above. However, for fast access with high bandwidth a wired network connection is necessary. High bandwidth tasks include viewing video files, working with large graphics files, and data-intensive simulations. Such tasks currently are best done on computers physically plugged into the LAN. Very high bandwidth tasks such as video editing are best done on local workstation hard drives or with high speed external drives connected to the workstation.

Installing a wireless network is less expensive than installing a wired network, since much less physical labor is involved in running wires and cables. However, wireless access cards and access points add to

the cost, and situating access points to ensure reliable coverage of a given area is challenging. In addition, wireless networks do not generally offer the speed or reliability of wired LANs. Many portable telephones and essentially all microwave ovens work at the same frequency (2.4 Gigahertz), and interference is a possibility. As wireless networks proliferate, interference from another nearby network may occur, though multiple channels are available. Security is a significant concern, because the wireless radio transmissions can be intercepted or rogue users can access network files and data that are not protected. Protections include barriers such as password or device authorization, and encrypting data transmissions. As with other networking technologies, deployment of wireless networking involves a considerable amount of work on the part of technology coordinators, network managers, and support staff. New management tasks range from the security concerns described above to maintaining and scheduling the use of mobile laptop computer labs. Currently, wireless computer networks are best suited for those areas or situations that are too costly or too difficult to wire, or where multiple users require temporary network access.

ADVANTAGES AND DISADVANTAGES OF A SCHOOL NETWORK

Information and Resource Sharing

The primary advantage of LANs is the ability to share resources. This can include network-wide access to software and hardware, file sharing by multiple parties, and centralized information databases. Examples include:

1. Students collaborating on a class project accessing their collective report from different computers at different times.
2. Teacher and student access to large collections of multimedia elements such as graphics, sound and video, which would otherwise consume huge amounts of disk space on each individual workstation.
3. Access to school records, administrative, and informational databases.
4. Inter-school, district-wide, and inter-district notifications or announcements.

5. Electronic attendance and grading, updated by teachers from their desktop workstations.
6. Access to class agenda, class assignments, and shared information on the server, accessible from home or on campus.

Enhanced Communication

Email enhances personal and professional communication for all school personnel, and it facilitates the dissemination of general information to the entire school staff. Email and Internet-based discussion areas can foster communication with home-based students, students and teachers at other schools, and individuals outside the classroom or school. With computer networks, you can connect remotely to library catalogs at your own library-media center or to libraries worldwide. A LAN lets you access software shared among your school's workstations, and network connections to the Internet allow you to sample and even download software developed around the world. These same connections can support distance learning and desktop videoconferencing. Parents and caregivers can electronically interact with the teacher on student progress, homework assignments, and other school activities. Web page creation and dissemination informs the community of school activities and programs. Teachers and schools can encourage widespread participation in learning by creating web homepages allowing access to lessons and tutorials for the entire community. LANs also connect different models of workstations and workstations from various vendors, such as Apple Macintosh or IBM-compatible computers, allowing them to communicate with one another.

Peripheral Sharing

If devices such as printers and fax machines are added to a network, they can be shared by many users. Individual workstations located physically apart in a classroom, lab, and library can share expensive equipment connected to the network, such as a color printer for graphics production. Speed-Networks provide a quick and easy method for sharing and transferring files between computers. Without a network, files are shared by copying them to diskettes or recordable CDs, then hand

carrying the disks from one computer to another. Dedicated lines and sophisticated switching equipment route data traffic much more efficiently.

Cost

Networkable versions of many popular software programs are available at considerable savings when compared to buying individually licensed copies. This eliminates the need to spend time and energy installing updates and tracking files on independent computers throughout the building.

Security

Access to files and programs on a network can be managed and controlled, reducing or eliminating illegal copying of programs. Passwords for specific server-based resources or directories restrict access to authorized users.

Freedom

Wireless networks offer many of the same advantages as wired networks, with the additional benefit of roaming free of wires and cables.

Disadvantages of a school network include the costs to install and maintain the network. Although a network will likely generate a significant return on investment, the initial installation costs are high. Cabling, network devices, and network operating systems are expensive, the installation requires routing and confirming connections, and the services of a technician are required. Proper maintenance and security of a network requires considerable time and expertise. A full-time network administrator is often needed.

NETWORKING IN EDUCATION TODAY

Networked computers now offer teachers and students access to vast information sources local and global, and connections to other members of the learning community near and far. The additional wiring and cabling needed for networks has often hampered the use of equipment and led to placement restrictions and inflexibility. The arrival of high performance, wireless notebook computers can help to eliminate many of the obstacles and

inconveniences that have hindered school technology integration in the past. Making learning resources and contacts available anywhere and anytime via wireless technologies is a natural extension of the educational applications of computer networks.

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TECHNOLOGY-ASSISTED PROJECT-BASED LEARNING (TA-PBL)

Students are engaged in technology-assisted project-based learning (TA-PBL) when they are trying to solve a problem or complete a task using information technology tools. The problems or tasks are guided by authentic issues that are central to the disciplines. Authentic questions drive the process of project-based learning. Researchers agree that “teachers and curriculum developers should work to help students define one or more guiding questions for their work and that curriculum should be driven by conceptually appropriate questions and offer a suitable degree of complexity to sustain the inquiry” (Feldman, Konold, and Coulter 1999). Other experts put it this way: “You cannot think well about a topic or question unless you have information, data, and facts. However, that information should be acquired not for its own sake but as a means of finding answers to a consequential question” (Gardner 1999). Papert suggested that powerful domains of knowledge are found in every discipline and that these powerful ideas can generate questions for investigation that are rich in connections and give rise to explosions of learning. (1999, 104).

In addition to authentic, curriculum-related questions, TA-PBL is a collaborative endeavor, requiring teams of students to work together and build on each other’s strengths (intelligences). A third requirement of TA-PBL is the production of some artifact or performance that is shared with an audience beyond the teacher or class. Artifacts provide external evidence of learning beyond writing a paper or taking a test. Examples include the making of physical models, designing a multimedia project, website, or WebQuest; producing a radio or television script or

a sample newsletter; or writing a play or poem. Seymour Papert called product production of this sort “constructionism,” i.e. the construction of some visible product that can be discussed, examined, probed, criticized, or admired. These product “outside, in the world” can give observers some insights about what is happening “inside the head” (p. 142).

Every TA-PBL needs authentic assessment; there is both peer and teacher feedback in all stages of a project (formative evaluation). Student- and teacher-designed rubrics are an essential part of TA-PBL summative evaluation. Rubrics are scoring tools composed of a list of criteria that indicate what dimensions are deemed important for the evaluation of any given project. Rubrics include varying levels of possible achievement for each criterion. Usually there are six levels with a set of three levels reflecting less than satisfactory accomplishment of a given criterion (no understanding, little understanding, or developing understanding) and three levels reflecting satisfactory accomplishment of any given criterion (capable, strong, exceptional understanding).

Appropriate digital technologies are assumed to be used in the planning, development, implementation, and evaluation phases of TA-PBL.

SAMPLING TA-PBL

Examples of TA-PBL can be found in a number of recent books, magazine articles, and websites. The following are some of the earliest examples:

1. Newspaper PBL: Teams produce an historical newspaper for a particular date from a particular city. The newspaper contains genuine local and regional news as well as reviews of sports, music, the arts, and science.
2. Greeting Card or Holiday Newsletter PBL: Teams design and mail out holiday cards or holiday newsletters reflecting celebrations in different cultures.
3. Redesigning space PBL: Teams use architectural engineering principles to redesign an existing space. The design includes lighting, heating, and airconditioning considerations as well as wall and floor covering components.
4. Fitness-Exercise-Nutrition PBL: Teams provide a profile of existing health features for the class, and a plan to improve them. Teams develop a mechanism for monitoring progress of the health features of the class.
5. Natural Environment PBL: Teams produce a natural history media production of a natural environment study site. The production will contain an audio and video documentation of the site’s natural and social science components.
6. Mall-monitoring PBL: Teams produce an economic report of men and women’s clothing found in a typical shopping mall. For each piece of apparel, the report contains cost, country of origin, and material composition. Teams produce an associated map that shows each country’s contribution to the clothing industry.
7. Opinion Survey PBL: Teams design surveys to collect social science data and design spreadsheets to analyze the collected data.

Selected WebQuests and Web Inquiry Projects (WIPs) are also examples of TA-PBL because they have the following characteristics: Webquests and WIPs use technology, mostly web-based resources, to answer an authentic question or solve an authentic problem. Teams of students collect and analyze data, create artifacts, and present their findings to others. Rubrics are often part of the assessment.

A series of ongoing web projects also reflect the essential features of TA-PBL. The distinguishing characteristic of these ongoing projects is a focus on real data, frequently accessed in real time. The Globe and Jason Projects are multiyear programs involving classrooms from around the world that interact with scientists and with each other. Earlier programs of this type included the National Geographic KidsNet project and the Global Laboratory Network, both sponsored by TERC.

A number of ongoing web projects serve as the core of activities reflected in TA-PBL. The WhaleNet site provides the opportunity for students to collect and analyze data from satellite tags placed on a variety of marine animals including Loggerhead turtles, Harp, Gray, and Harbor seals, and a variety of whales. The site describes its activities:

WhaleNet establishes Internet communications amongst students, researchers, and educators from around the world to share and use actual

research data and personal field experiences for collaborative learning; to foster interdisciplinary education and environmental awareness; and to enhance interest in science and mathematics. WhaleNet uses telecommunications to offer students and teachers a source of data and information for interdisciplinary classroom lessons, curriculum resources, and interactive support. (www.WhaleNet.org)

PROJECT-BASED LEARNING AND PROBLEM-BASED LEARNING

Project-based learning and problem-based learning are terms used to describe conceptually similar instructional strategies. The literature on project-based and problem-based learning reveals both similarities and differences between the two.

Some similarities: Project-based learning and problem-based learning activities are intended to engage students in authentic, “real world” tasks. Both approaches are defined as student-centered, with the teacher in the role of facilitator. Students generally work in cooperative groups for extended periods of time. Both of these approaches include an emphasis on authentic, performance-based assessment.

Some differences: Project-based learning typically begins with an end product in mind. The product requires specific content knowledge, varies widely in scope and time frame, and varies widely in the level of technology used. The entire experience is meant to be authentic, mirroring real world activities and approaches to accomplish the tasks. The end product is the driving force in project-based learning, but it is the content knowledge and skills acquired during the production process that are important to the success of the project approach.

Problem-based learning begins with a problem for students to solve or learn more about. Problems are often framed as scenarios or case studies designed to imitate the complexity of real life. Inquiry and research (rather than the end product) is the primary focus of problem-based learning. After students are presented with a problem, they organize any previous knowledge on the subject, pose additional questions, identify areas they need more information, devise a plan for gathering more information, do the necessary research, and reconvene to share and summarize their new knowledge and present their conclusions. There may or may

not be an end product. See the multimedia project at <http://pblmm.k12.ca.us/PBLGuide/PBL&PBL.htm>.

THEORETICAL SUPPORT FOR TA-PBL

Moursund (1999) provides a case for TA-PBL by examining current theoretical learning positions, observations aligned with accepted educational goals, and research into human intelligence. The major theoretical learning positions include constructivism, situated learning, motivation theory, inquiry-based learning, and cooperative learning.

Constructivism suggests that students construct their own knowledge through active, not passive, activity. Situated learning suggests that learning activities should have a genuine context of social interaction. Motivation theory posits that students who are motivated by meaningful experiences (those experiences in which they can find relevancy to themselves) will learn more and remember it better. Inquiry-based learning centers on questioning and systematic investigation. TA-PBL provides the context for this type of learning. Cooperative learning results from training students how to work in groups, monitoring their group efforts, and reflecting on ways to make the group enterprise work better. Cooperative learning is effective in improving the academic and social skills inherent in TA-PBL.

Accepted educational goals include learning how to carry out complex interdisciplinary projects; acquiring, understanding, and actively using acquired knowledge and skills; mirroring the steps of process writing; and meeting the content and technology standards of the profession.

Research into human intelligence centers on the work of Howard Gardner, Robert Sternberg, and David Perkins. Gardner argues that people have eight or more different kinds of intelligences generally aligned with various academic areas (1993). Gardner’s work would suggest that curriculum (TA-PBL) should try to enhance each of them. Sternberg posits that people have three general types of intelligence—practical, experiential, and componential (1997). He also suggests that TA-PBL provides an opportunity to enhance all three types. Perkins suggests that TA-PBL can increase the efficiency of neu-

ral intelligence and provide opportunities for the enhancement of experiential and reflective intelligence (1992).

RESEARCH ON PROJECT-BASED LEARNING

A combination of testimonial and empirical research provides a composite view of the benefits or effectiveness of TA-PBL. Students show an increase in motivation and problem-solving ability, improved attitude towards learning, improved library research and resource-management skills, and ability to collaborate and cooperate on tasks with no disadvantage in knowledge acquisition. Using TA-PBL, students perform as well on standardized tests as students in traditional classrooms and teachers as well as parents recognize a greater enthusiasm among students participating in TA-PBL.

CRITICISM OF TA-PBL

The activities inherent in TA-PBL must involve serious work in the minds of the students. Content must never be shallow or activities artificial. Content and concepts from the disciplines must be used as the means to establish interest. The most common mistakes noted in TA-PBL lessons include trivializing or sensationalizing topics; making the whole point of an activity an examination of oneself; performing skits or theatrics of serious work; or engaging in events too complex.

IMPROVING TA-PBL

A recent yearlong case study of using a five-part TA-PBL process in an eighth-grade mathematics class provides some insights into the strengths and weaknesses of this instructional approach (McGrath, Viner, and Sylvester 2003). The first two of the five projects were used to learn specific software (Hyperstudio and STELLA) as well as mathematical concepts. The latter three projects followed the traditional steps of TA-PBL in that students, assisted by technology, worked in teams to answer a specific task, generated artifacts of their learning, and presented their results to various audiences. A summary of recommendations and suggestions regarding the improvement of TA-PBL based on this

and other research would focus on the adjustments that teachers should be prepared to make for the factors of time, interpersonal relationships, and student engagement.

With respect to time, if too many class members got stuck on one part of the project, the instructor should move the class to another part of the project and return to the challenging part at a later time. If the project represents new learning and not reinforcement, then students must be given the additional time they need to finish the project. Use many intermediate “deadlines” for finishing intermediate parts of the project.

Interpersonal relationships can be proactively strengthened by choosing strong-willed students to work with similar students, weaker-willed students to work with similar students, and loners to work singly. Instructors must get to know the work habits of their students before they engage in group selections. Change groups as often as necessary.

Regarding engagement, the researchers suggest that if the project isn’t engaging to the students, change the project or change your expectations. Expect more engagement from students as they become more comfortable with the TA-PBL approach. Pre-learning activities are essential. In addition to learning how to use new hardware and software, students must be taught how to do a project, to work as teams, to deal with peer evaluation, to participate in the creation of rubrics, and to examine good and bad examples of finished products.

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TEACHING AND LEARNING: THE WORLD WIDE WEB ---

The World Wide Web holds great promise for the enhancement of teaching and learning in twenty-first century classrooms. Educators and students have access to more information than at any other time in history. The WWW has made it possible to communicate with distant classrooms across the globe and experts in just about any field. Educators and students can find raw scientific data, census statistics, and historical primary sources that, not long ago, would have been nearly impossible for the av-

erage person to access. The challenge for educators is to find worthwhile ways for students to use this information. Like any other educational tool, the mere presence of the WWW in a classroom does not guarantee that learning will take place; it is how the WWW is used within the context of the classroom curriculum that is most important.

THE WWW AND ITS EFFECTS ON LEARNING

As educators have become increasingly aware of the multitude of educational resources available on the World Wide Web, many are using it as an educational tool. Many educators, especially those who define learning as an active, learner-centered process, view the WWW as an ideal learning environment. However, there is some question as to the Web's role in the learning process.

Long before the WWW became a ubiquitous part of society, researchers began to debate the merits of using multimedia artifacts in the classroom. As a multimedia tool bringing together various combinations of text, graphics, animations, sound, and video, the WWW has become part of the debate over whether media affects learning. On one side of the debate it is believed that there is a link between the type of media used with learners and their level of cognitive processing. Robert Kozma (1994) believes that the specific attributes of a chosen media can aid the learner. The nonlinear setup of the WWW is a unique attribute that allows learners to choose their own learning paths. On the other side of the debate it is believed that media itself has no effect on cognitive processing; it is the accompanying method used along with the media that makes the difference in learning (Clark 1983, 1994). In doing a review of meta-analyses of media effects on learning, Richard Clark (1983) found evidence that there was no significant difference in learning benefits from any one type of media. What was significant was the method used in conjunction with the media.

When it comes to using the WWW in the classroom, many educators find themselves drawing from both sides of the media debate, combining the best the Web has to offer with interesting, well-designed activities that support classroom curriculum. As a relatively new kind of media, the World Wide Web offers a wealth of resources, which include hypermedia, audio, video, graphics, real-time data,

and primary source documents. Simply browsing through these documents affords students little educational value. However, integrating the use of these media attributes with purposeful tasks designed to make use of students' higher level thinking may have a positive impact on learning. David Jonassen (1993) conducted three studies on the use of hypertext environments for learning and found that merely retrieving information from the WWW did not result in meaningful learning. However, giving students a specific task and a clear purpose resulted in a deeper processing of information. In other words, while having access to information is important, it is not enough; educators must find meaningful ways for students to use the information. David Shenk (1997) refers to organizing information and presenting it clearly so that students can use its bits and pieces to construct knowledge of their own. Information itself is useless unless it is presented clearly and used thoughtfully. Judy Harris (1998), Bernie Dodge and Tom March (1995), and Philip Molebash (2002) have all developed ways to effectively utilize the best of the WWW within education.

ACTIVITY STRUCTURES

Harris (1998) describes the use of three broad categories of activity structures for utilizing the WWW effectively with students.

Interpersonal Exchange activities involve using the WWW's communication features such as email and discussion forums for exchanging information with peers, distant classrooms, or experts in a specific field. *Information Collection and Analysis activities* involve collecting, sharing, and sometimes pooling information with other classrooms. *Problem Solving activities* are often authentic, real-world activities that require devising a solution to a problem based on data previously collected.

The key to developing a worthwhile activity using the WWW is to decide on a topic that fits into the classroom curriculum, search the WWW for appropriate resources, and identify objectives to be accomplished by using the activity. Teachers must first critically analyze each website to be used and then decide on the structure of the activity. Judi Harris's website, Virtual Architecture, (<http://virtual-architecture.wm.edu/index.html>) describes each activity structure in detail, giving examples and web addresses.

WEBQUESTS

Like activity structures, the WebQuest format was developed to take advantage of the very best of the WWW without exposing students to some of its negative parts. In "Some Thoughts About WebQuests," (1995) Dodge and March describe the WebQuest format as "an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis, and evaluation." (Dodge and March 1995)

The WebQuest has become an educational phenomenon. A simple search using the term "WebQuest" on popular search engines such as Google or Yahoo, turns up hundreds of thousands of websites with WebQuest in the title. Many teachers have embraced the idea of having their students use the best of the Web within a well-designed framework, so a good number of these websites are teacher created WebQuests. However, many of these quests are lacking the critical components of the original WebQuest idea, which makes them nothing more than Internet treasure hunts. At a very basic level, the WebQuest is made up of the following six components:

1. *Introduction:* The introduction is intended to set the stage and motivate students to begin thinking about the subject the teacher has identified. The best introductions are creatively written and pull the students in, often basing the WebQuest on real world events or issues.
2. *Task:* The task is an important part of the WebQuest. It defines the purpose for using the WebQuest and informs the student what the end result of the WebQuest will be. It is intended to be more than a retrieval of factual information and should require students to use critical thinking in order to accomplish the task. Dodge (2002) has identified several categories that WebQuest tasks could fall under: compilation tasks, mystery tasks, journalistic tasks, design tasks, creative product tasks, consensus-building tasks, persuasion tasks, self-knowledge tasks, analytical tasks, judgment tasks, and scientific tasks. Most WebQuests will utilize a combination of two

or more kinds of tasks that will require critical thinking on the part of the students.

3. *Process:* The process is where the teacher is able to provide some scaffolding for the students by laying out the steps required to accomplish the tasks. Included in the process are how the students will be grouped and which roles are responsible for specific tasks. Graphic organizers may be used.
4. *Resources:* The resources are usually included as part of the process. Evaluating a site for its intended audience, author's credentials, content-accuracy of facts, bias, style and functionality, and ease of navigation (Jacobson and Cohen 1996) is essential before including it in a WebQuest. Additionally, a website should offer more than text on a page. It should offer students something unique in the way of real time data, video, primary sources, or museum pieces.
5. *Evaluation:* The evaluation section gives students an overview of how they will be assessed on the task that has been assigned. It is clearly laid out, often in the form of a rubric.
6. *Conclusion:* The conclusion wraps the project up but not too completely. It leaves the door open for further exploration and may plant the seed of an idea for further study.

As the most important parts of the WebQuest, the task, process, and resources must be interesting, clear, easy to follow, and doable. In the process of completing the task or tasks, students must be doing more than searching for answers on a website so that they may fill in the blanks on a worksheet. In a WebQuest, it is the specific method by which all of its components are put into action to foster a higher level of thinking that stands to make a difference in the cognitive processing of the users. The WebQuest page hosted by San Diego State University's Department of Educational Technology (<http://WebQuest.sdsu.edu/>) houses an extensive database of WebQuest examples and training materials for teachers who would like to create their own WebQuests.

WEB INQUIRY PROJECTS

Web Inquiry Projects (WIPs) are lesson plans that promote student inquiry using WWW resources

(Molebash 2002). Like a WebQuest, a WIP makes use of the best information on the WWW, specifically raw, uninterpreted data. However, that is where the similarities end. A WIP is much less structured than a WebQuest. Consisting of the following six stages, its purpose is to provide scaffolding for educators who want to provide authentic inquiry experiences for their students:

1. *Stage 1, The Hook:* In the first stage, students are motivated, or hooked, by an intriguing set of questions presented by the teacher.
2. *Stage 2, The Question:* The question stage follows with students generating questions related to the topic.
3. *Stage 3, The Procedure:* Guided by the teacher, students then proceed to the procedure stage where they begin to set up procedures for investigating their questions.
4. *Stage 4, The Data Investigation:* During the data investigation stage, students begin searching for online data that might help answer their questions. The teacher provides guidance and direction as necessary.
5. *Stage 5, The Analysis:* Students analyze and interpret using tools such as spreadsheets, databases, or concept-mapping software.
6. *Stage 6, The Findings:* Students present results through written reports, presentations, and class discussions.

WIPs can be used within any curriculum area, but they are better suited for use with older students or those who have extensive experience using the WWW. More background information and examples of WIPs can be found on the website maintained by Molebash and hosted by San Diego State University at <http://edweb.sdsu.edu/wip/>.

SKILLS FOR SURVIVING THE INFORMATION AGE

The amount of information we have access to in the twenty-first century is staggering and promises to continue to grow at an exponential rate. Knowing how to filter out the bad or useless information from the valuable information is a lifelong skill for survival in the Information Age. Using the WWW as an educa-

tional tool requires that teachers know how to critically evaluate resources they will be using with students. Activity Structures, WebQuests, and WIPs all require teachers to focus on a curriculum area and search the WWW for resources. While searching for resources, educators should keep the following criteria set forth by Jacobson and Cohen (1996) in mind:

1. *Purpose of the site/intended audience:* Who was the site designed for? Is it age appropriate?
2. *Credentials of the source/author:* Who is the author? Is the author an expert in the field? Is there a way to contact the author? If the author is listed as an organization, is it a reputable organization? This is especially important because of the ease with which anyone can publish a document on the Internet.
3. *Content:* Is the information accurate? Is there any bias shown?
4. *Style:* The style of a website includes such elements as mechanics, grammar, spelling, and ease of navigation throughout the site. The text should be free of errors.
5. *Is it worth it?* In a classroom situation, is the site worth using over more traditional sources of information, such as books, journals, and other hard copy sources? Can the site's information be used to address local, state, or national curriculum standards?

The importance of looking at WWW documents with a critical eye is an essential skill for teachers who plan to use it in their classrooms. It is akin to reviewing trade books or textbooks before using them with students. Students must also learn to look critically at information they find on the WWW. Kathleen Schrock (1995), author of "Kathy Schrock's Guide for Educators," (<http://school.discovery.com/schrockguide/>) has created evaluation surveys for elementary, middle school, and secondary level students. Each survey requires students to look critically at Web resources based on the usability of the site, authorship, and content. For students, the ability to critically analyze the information found on a website will become a necessary skill as our society continues to be inundated with large amounts of information.

The WWW is filled with rich resources that can enhance teaching and learning in any curriculum area. Best practice in the classroom is focused on

students using it in authentic and meaningful ways to access, interpret, and analyze information. Well-designed lessons such as WebQuests, WIPs, and Activity Structures take advantage of the unique attributes of the WWW.

Michelle Fraboni

ACADEMIC STANDARDS AND TECHNOLOGY

An academic standard is a written expression that describes, for each discipline, what students should know and how they should demonstrate that knowledge. Standards expressed in this fashion are called content (what) and performance (how) standards. Many view the publication of *A Nation at Risk* (National Commission on Excellence 1983) as the initiating event of the standards-based education movement. The rationale for standards was straightforward: All the industries that serve the public—building trades, food services, water supplies, and so forth, have strict standards of performance to protect the quality of life. Similarly, schools should have standards in place to protect the quality of their intellectual mission.

In 1989 at the Education Summit in Virginia, then-President George H. W. Bush and the nation's governors agreed on an educational agenda that included this specific standards-based goal: By 2000, American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, science, history, and geography. A variety of national subject-matter organizations proceeded to devise standards for their respective areas. The National Council of Teachers of Mathematics, the American Association for the Advancement of Science, the National Council for the Social Studies, and other organizations all produced standards-based expressions of their respective disciplines. States and local school districts subsequently used these national-organization standards to produce their own versions of a standards-based curriculum. Organizations like Mid-continent Research for Education and Learning (McREL) and

the National Association of State Boards of Education (NASBE) provided clearinghouses of standards-based information and resources to assist local districts in the preparation of their own curriculum. As instructional technology began to permeate the K–12 curriculum, a separate standards-based technology document was created.

TECHNOLOGY STANDARDS: HISTORICAL DEVELOPMENT

The International Society for Technology in Education (ISTE) was responsible for creating the most widely used technology standards in the United States. ISTE is a nonprofit organization with a worldwide membership dedicated to providing leadership by advancing the use of technology in education. ISTE began in 1989 when the International Council for Computers in Education (ICCE) merged with the International Association for Computing in Education (IACE). David Moursund at the University of Oregon founded ICCE in 1979. This organization began publishing *The Computing Teacher*, a periodical formerly called *The Oregon Computer Teacher*. The title of this magazine was subsequently changed to *Learning and Leading with Technology* in May 1995. This publication remains the major magazine devoted to computer-using educators, especially at the K–12 levels as well as those professionals in teacher education. Beginning in the late 1980s, ISTE's organizational committees began work on accreditation and standards. ISTE eventually became the home of the National Educational Technology Standards (NETS) project.

NATIONAL EDUCATIONAL TECHNOLOGY STANDARDS

After a decade of development, ISTE has produced six major standards documents. They include:

1. *National Educational Technology Standards for Students*, (NETS-S) (ISTE 1998). The technology foundation standards for students are divided into six broad categories: basic operations and basic concepts of technology systems; technology issues associated with social, ethical, and human concerns; technology productivity; communications tools; re-

search tools; and problem-solving and decisionmaking tools.

Performance indicators are described for each of these six categories across four different grade levels, PK–2, 3–5, 6–8, and 9–12. An example from each of these grade levels for the basic operations category might include the following: For PK–2, students will be able to use input and output devices to control a variety of technologies; for grades 3–5, students will be able to use common input and output devices, including adaptive devices, to operate a variety of technology devices; for grades 6–8, students will be able to solve routine hardware and software problems related to technology; and for grades 9–12, students will be able to choose appropriate technology to solve particular problems. There are forty performance indicators, ten per grade level, described in the NETS-S document.

2. *NETS for Students—Connecting Curriculum and Technology* (ISTE 2002b). This document provides models for using technology in the classroom. Lesson plans, sequenced by grade level, show the connection between teaching English, Social Studies, Mathematics, Foreign Language, Science, and Language Arts and the technology standards. A variety of multidisciplinary units are also described.
3. *National Educational Standards for Teachers* (NETS-T) (ISTE 2000). Teachers entering classrooms will know a new suite of technology skills summarized in six major standards:
 - a. Teachers will demonstrate a sound understanding of technology operations and technology concepts.
 - b. Teachers will plan, design, and implement effective learning environments supported by technology.
 - c. Teachers will implement curriculum plans that use technology to maximize student learning.
 - d. Teachers will apply technology to facilitate effective assessment and effective evaluation.
 - e. Teachers will apply technology resources to enhance their productivity and to enhance their professional practice.
 - f. Teachers will understand important issues

surrounding the use of technology in PK–12 including social, ethical, legal, and human concerns.

The NETS-T document provides a number of performance indicators for each of the six categories.

4. *NETS for Teachers—Preparing Teachers to Use Technology* (ISTE 2002c). This document was designed for use in teacher-education curriculum classes. The text contains forty learning activities across all subject matter areas. Separate chapters describe staff development, student teaching, assessment, and model strategies.
5. *National Educational Technology Standards for Administrators* (NETS-A) (2002a). The technology foundation standards for administrators are divided into six broad categories for each of three levels of administrators—superintendents, principals, and district program directors. The categories include: leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. A variety of performance indicators are given for each administrative class and category.
6. *Making Technology Standards Work for You—A Guide for School Administrators* (Brooks-Young 2002). This document provides superintendents, principals, and district program directors with detailed suggestions for implementing a vision of effective technology use. It includes separate sections on curriculum and instruction, planning, assessment, staff development, and social and legal issues.

INFLUENCE OF TECHNOLOGY STANDARDS ON TEACHER ACCREDITATION

The National Council for the Accreditation of Teacher Education (NCATE) certifies a growing number of teacher preparation programs in the United States. Many states require all of their teacher preparation programs to be certified by NCATE. Other states, such as New York, are in the process of requiring all their teacher education programs to be

certified by the middle of this decade. Proponents of NCATE suggest that NCATE certification is a rigorous process and institutions seek this certification as a way to demonstrate to the public the quality of its graduates' preparation to teach. However, there is little, if any, research to support this claim. ISTE has provided NCATE with the *NETS for Teachers* (2002c). It is the college's responsibility to provide substantive evidence that its graduates can meet all of the technology performance indicators.

INFLUENCE OF TECHNOLOGY STANDARDS ON STATE AND LOCAL CURRICULUM

Over the past decade, many states have established their own comprehensive learning technology standards. By 1999, thirty-five states had passed technology standards for students, and twenty-six had introduced technology standards for certification and recertification of teachers. Many of these states correlate their own curriculum standards with those expressed in ISTE's NETS project. As an example, New York state uses the six categories from the NETS-S document and aligns standards from their Math, Science, and Technology (MST), English Language Arts (ELA), Social Studies (SS), and Career Development and Occupational Studies (CDOS) curriculum guides. As an example, under the category "Technology Research Tools," the NETS performance criteria requires students to use technology tools to process data and report the results. Using the CDOS curriculum guide, New York state correlates this NETS standard with the performance requirement that students use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data (NYSED, See www.emsc.nysed.gov/guides/cdos/).

Other states have developed technology standards from their own perspectives. Wisconsin, for example, examines their "information and technology literacy" standards by grouping them into four content standards: Media and Technology, Information and Inquiry, Independent Learning, and The Learning Community. For each of these content standards and for grade levels 4, 8, and 12, specific performance standards are listed. For example, for grade 4, under Media and Technology, students are expected to develop touch keyboarding techniques using both

hands. (Wisconsin Department of Public Instruction. See www.dpi.state.wi.us)

Some local school districts have also written their own teacher technology standards. For example, Horry County Schools in South Carolina have developed a set of detailed teacher technology proficiencies that lists eleven components of technology literacy and three levels of performance under each level. For example, under Component 6 (All teachers will be proficient users of spreadsheet software as a teaching and learning tool), Level 2, demonstration of proficiency requires the teacher to create, format, and print charts and graphs. (Horry County School District. See www.hcs.k12.sc.us).

National standards, such as those created by the International Society for Technology in Education (ISTE), the state guidelines in New York, and the local Horry County standards offer frameworks for digital literacy. These frameworks include useful descriptions of the technology skills students and teachers should acquire, and offer age-based benchmarks for students' technological achievement. In some cases, standards packages provide teachers with supplemental materials, such as sample lesson plans and a cross-reference with curriculum standards in other subject areas.

ASSESSING TECHNOLOGY STANDARDS

In a standards-based system, the content and performance standards are linked to assessments tied to the standards. However, states and local educational agencies establish various methods of accountability for meeting them. Standards suggest a direction but do not map out a path. While prescriptions for technology skills help to establish objectives for technology use, it is still up to schools and teachers to create the means of reaching those goals. States, districts and schools must ensure technology use is aligned with standards, educational objectives, curriculum and assessment. As the standards, educational objectives, curriculum and assessment evolve, technology use must be modified to support these goals. The lack of alignment is most pronounced in student assessment. There is often a widespread mismatch between technology standards and assessment.

A Boston College study demonstrated that the

methods of evaluating student learning should reflect the tools used in instruction. This study showed that for a student accustomed to writing on a computer, responses written on computer scored substantially higher than those written by hand. As part of the study, students in grades 4, 8, and 10 were given the composition item from the 1999 Massachusetts Comprehensive Assessment System (MCAS) language arts tests and randomly assigned to write their responses on paper or on the computer. All essays were transcribed to computer text so that MCAS raters did not know the mode in which they were written. Results showed that students who composed on computer or mini-word processors scored considerably higher than students who wrote on paper. Out of a total of twenty points, essays composed on computer scored about two points higher than essays written on paper. Based on the 1999 MCAS results, the report states that allowing students the option to write both the MCAS composition item and the four shorter open-ended items on computer would move about 19 percent of fourth graders from the "needs improvement" category into the "proficient" category. In the case of one elementary school, the number of students scoring in the "proficient" category would jump from 35 percent to 60 percent. Overall, the number of students in each grade level performing in the advanced category would double.

Current assessments do not often evaluate achievement that includes the extensive use of technology. This situation is not unusual. The continually evolving nature of standards often means assessment lags behind the creation and implementation of standards. While most states and virtually all school districts administer tests of established standards, it is still rare to find tests that have been systematically aligned to the officially-adopted technology standards.

TECHNOLOGY IN SUPPORT OF STANDARDS

Educational technology also offers tools to improve student achievement and to support accountability frameworks focused on twenty-first century skills. (Missouri Department of Elementary and Secondary Education 2003) Analysis of *Enhancing Missouri's Instructional Networked Teaching Strategies* (eMINTS) compared 2001 and 2002 Missouri As-

essment Program (MAP) results for eMINTS students and non-eMINTS students in the same school building. Each eMINTS classroom was equipped with a teacher's desktop computer and laptop computer, a scanner, a color printer, a digital camera, an interactive white board, a digital projector, and one computer for every two students. All computers have basic productivity software and high-speed Internet connections. A two-year evaluation of eighty-five eMINTS classrooms showed that the students who participated in the program scored consistently higher in every subject area on the state's standardized tests.

The North Central Regional Educational Laboratory (NCREL) Report *Computer-Based Technology and Learning: Evolving Uses and Expectations* (Valdez et al. 2000) finds:

1. Technology offers opportunities for learner control, increased motivation, connections to the real world, and data-driven assessments tied to content standards that, when implemented systemically, enhance student achievement as measured in a variety of ways, including, but not exclusively limited to, standardized achievement tests.

2. Policymakers are demanding greater accountability for technology use, both because of resource expenditures and because research shows that the ability to use technology effectively is now necessary for all lifelong learners.

STANDARDS MOVEMENT ON BALANCE

As the leading reform movement of the 1990s, the standards movement, including the technology standards, has not been without criticism. Some see it as a major drain on resources that are needed for basic materials. Others view it as a burden on those who do not traditionally do well in school. Some compare it to failed efficiency and behavioral objectives movements. Others point out the sheer volume of the effort and see it as overwhelming the teacher in the classroom. Balancing this criticism, however, are continued efforts to link technology integration, student achievement, and school reform to standards-based protocols.

Daniel J. Brovey and Andrew J. Brovey

RESEARCH CONNECTING LEARNING AND TECHNOLOGY USE

Over the past twenty-five years, several hundred research articles have been published about the use of technology in K–12 education. These articles reflect a variety of opinions and conclusions. On one end of the continuum, supporters cite research studies showing the positive impact of technology in the student learning environment. On the other end, critics present arguments that there is little evidence from research to support the claim that the use of technology in classrooms is worthy of the resources required. What is clear is that the research consistently shows that technology per se does not directly improve teaching and learning. A central theme of the research is that computer-based technology, like the more classic classroom tools such as pens and pencils, chalkboards, and the overhead projector, is a means, not an end. Its power lies in how it is used. Yet, unlike traditional instructional technologies, computer technology is both complex and relatively expensive, and less is known about how to fully realize its potential. Research shows that in addition to monetary investments, substantial planning and organization are required if computer-based technology is to enhance student learning. The context in which the technology is employed, the level of planning and integration, and the people involved largely determine technology's impact.

THE USES OF TECHNOLOGY

An examination of studies on the use of technology in classrooms yields two general conclusions. First, though research studies, literature reviews and analyses provide evidence of the positive impact of technology on student learning, the results often address a specific set of learners and conditions. Second, though typical assessments such as standardized tests can gauge student achievement in basic skills, determining technology's impact on other areas of student learning remains a challenge, and results are far less conclusive.

Thomas Reeves (1998b) offers a helpful way of distinguishing different uses of technology, describing learning “from” computers as different than

learning “with” computers. Learning *from* computers occurs when the technology functions essentially as a tutor, structuring the learning process for students. Much drill-and-practice software and many computer-assisted instruction programs, for example, lead students through a series of problems or activities designed to develop their skills and knowledge. In these cases, the technology is an instructional delivery system, directing the students through a learning process. Research shows that having students learn *from* computer-based technology can improve basic skills, particularly in subjects such as mathematics, language arts, writing fluency and science. Such learning is relatively easy to measure with traditional tests of academic achievement.

By contrast, students learn *with* technology when they exert greater control and assume a more active role in their own learning. In this case, students use technology as a tool for problem solving, conceptual development, and critical thinking. For example, students are learning *with* technology when exploring the World Wide Web to carry out a research project and when using e-mail to collaborate with others about their work. The benefits of learning *with* technology tend to be more difficult to measure. Few assessments adequately measure the skills that these kinds of technology enhance, such as critical thinking, other higher-order thinking skills, writing, and problem solving. Rapid changes in technology and the challenge of measuring such outcomes in a working classroom also make outcome assessment difficult.

LONG-TERM RESEARCH

James Kulik (1994) and his colleagues from the University of Michigan have completed numerous meta-analyses over the past twenty years to determine the effectiveness of computer-based instruction on student learning. A meta-analysis is essentially a study of studies, where multiple research study results are systematically and collectively examined to identify common factors. Kulik's work showed that students usually learn more, and in less time, in classes with computer-based instruction. Students reported enjoying classes more when they received computer help and they learned as much or more from computer-based tutoring as from peer and cross-age tutoring.

Larry Cuban (1986), a professor at Stanford University, has also studied the impact of computers in

classrooms for some twenty years. His work supports research conclusions that drill and tutorial software positively impact student learning. He indicated educators first should determine the goals of the school or district, and then decide how technology can help reach those goals. According to Cuban, it is also necessary to determine what has to change in the current instructional process and school environment in order to integrate technology effectively and insure a positive impact.

The ten-year Apple Classrooms of Tomorrow (ACOT) research project studied the influence of technology rich environments and staff development on teaching and learning among teachers and students. In some phases of the project, two computers were given to each teacher and student in selected classrooms in five schools in different regions of the United States. In another phase of the project, six hundred teachers from fifteen states and two foreign countries participated in training sessions focused on technology integration. ACOT researchers found when technology was integrated into good writing instruction, students were more engaged, wrote more efficiently, and were able to use more descriptive vocabulary than they could without technology. Ninety percent of the ACOT students went on to college as opposed to 15 percent from the rest of the school. The ACOT dropout rate was zero year after year, while for the school as a whole it was 30 percent. Overall attendance was far better for ACOT students than the rest of the student body. ACOT research also documented that students and teachers using technology adopted a more collaborative learning environment. Student engagement remained highest when technology use was integrated into the larger curricular framework, rather than being an "add-on" to an already crowded curriculum. The ACOT project also recommended 30 percent of available technology resources be dedicated to ongoing staff development for teachers.

STUDENTS, TEACHERS, AND TECHNOLOGY

Students, especially those who are disadvantaged, learn basic skills such as reading, writing, and mathematics better and faster if they have a chance to practice those skills using technology. Sophisticated skill-building programs engage students and can

adapt to improving skill levels, and as a result students spend more time on basic learning tasks or progress more quickly than students who use a more traditional approach. According to researchers at the North Central Regional Educational Laboratory (Valdez et al. 2000), computer-based technology used in a tutoring capacity is most effective when there is a match among the software, the objectives of the instruction, students' prerequisite knowledge and skills, and teachers' understanding of the needs of the learners. In general, the success or failure of a technology requires determining where it can have the highest payoff, and then matching the design of the application with the intended purpose and the needs of the end users. Computer applications to improve basic skills are easily linked to learning standards and the increasing need for assessment. Stakeholders and policymakers are demanding greater accountability for technology use, both because of its cost and because the ability to use technology effectively is necessary for lifelong learners. The success or failure of technology-based learning largely depends on the congruence of the software design and the instructional environment surrounding its use.

Technology offers educators a way to individualize curriculum and customize it to the needs of individual students. Students with access to a broad range of technologies can use a variety of media to more clearly express their ideas. Technology can decrease absenteeism, lower dropout rates, and motivate more students to continue on to college. Students who regularly use technology often take more pride in their work, have greater confidence in their abilities, and develop higher levels of self-esteem.

The most pervasive perception among teachers is that computers have improved the climate for learning by increasing student motivation in subjects for which they use computers. Researchers who have examined differences in student perceptions of learning have typically found improvements in students' self-reports of their own motivation and learning in response to computer applications.

In addition to investigating schools and classroom settings, researchers have examined the impact of students' and teachers' use of home computers. Not surprisingly, most have found that home access augments classroom use by teachers and improvements in student achievement. For example, a New Jersey study

examined seventh, eighth, and ninth graders who had sustained access to technology, such as word processing, spreadsheet, email and the Internet, at home and at school. These students did significantly better on standardized writing tests than students who had access to similar technology only at school. In an Indiana study, students who were supplied with home computers and modem access to their school showed improvement in writing, math, and problem solving skills, as well as greater confidence in their own abilities and the ability to teach others. Of course, having a computer at home does not necessarily ensure that students are using the computer in ways that will increase their academic achievement. Like students, teachers can often improve their skills with access to a home computer, but there is no guarantee of this. For example, elementary school teachers in the Apple Classrooms of Tomorrow project did not have time to develop appropriate homework assignments using computers. Consequently, in later years, the project continued providing home computers only at the high school site.

A review of research shows that technology can help students develop diverse skills from the basics to higher-order thinking. Technology offers opportunities for learner-control, increased engagement, connections to the real world, and data-driven assessments tied to content standards. Computer-based learning can enhance student success as measured in a variety of ways, including, but not limited to, standardized achievement tests.

Researchers have attributed a variety of benefits to computer-based technology applied to learning. Yet, because measuring such effects is challenging, it has not been easy to assess the value of computer-based technology in education. There are few reliable, valid, and cost-effective assessments for measuring such qualities as student engagement, critical thinking, or the ability to make inferences, synthesize results, or work collaboratively. Furthermore, classrooms are not experimental laboratories where variables can be tightly controlled, and the product life cycle of hardware and software is far shorter than the typical timeline for educational research studies. Thus, it is not surprising that the impact of technology on learning continues to be debated by educators and researchers alike.

Andrew J. Brovey and Daniel J. Brovey

TECHNOLOGY AND SCIENCE TEACHING

The intersection of teaching, science, and information technology invites a new perspective on learning about the natural and social world using modern digital tools. Teaching, for example, can be defined as the creation of learning environments that are interesting from the learner's point of view and connected to some important ideas in the discipline. Science (as a verb) is defined as the collection and analysis of real-world data to get some idea of how the world "works." The newest forms of science-related Information Technology include: Internet websites designed by professional science organizations; Web-based designed resources (e.g., science portals and ongoing science projects); new types of digital science software (e.g., Geographic Information Systems (GIS); and digital science probes (e.g., Microcomputer-Based Laboratory [MBL]). When we teach science using this new generation of digital tools we are creating learner-appropriate environments that use the tools of modern learning technology to collect and analyze data about the natural or social world.

SCIENCE ORGANIZATIONS

The mission of The National Science Teaching Association (NSTA) is "to promote excellence and innovation in science teaching and learning for all." One of NSTA's guiding principles is to serve as the voice for excellence and innovation in science teaching and learning, curriculum and instruction, and assessment. It was founded in 1944 and is the largest organization in the world with a current membership of more than 55,000 persons.

NSTA'S MAJOR SCIENCE-TECHNOLOGY INITIATIVES

SciLinks is an initiative that correlates the pages of science textbooks with resources on the Internet. The links connect users to websites directly related to the lessons in the textbooks. SciLinks icons and codes are placed in the textbook for key science subjects. After logging onto the SciLinks website (<http://>

scilinks.org), students enter the codes and are guided to age-appropriate websites selected by NSTA's subject matter experts. The SciLinks program makes the Internet a powerful and relevant learning tool. It represents a cutting-edge method of assisting teachers, students, and parents in the science teaching and learning process.

NSTA launched an online institute for the professional development of science teachers in January of 2002 (<http://institute.nsta.org>). The institute is a professional development gateway providing educators with course opportunities on a continuing basis. The portal for the institute currently lists six professional affiliates: American Museum of Natural History Seminars on Science; The JASON Academy; Lesley University Science in Education Program; National Teachers Enhancement Network (NTEN); the University of Maryland Life Sciences Program; and the University of Massachusetts Extension Nutrition Education Program.

NSTA publishes four major science magazines covering all instructional levels: *Science and Children* has a focus on K–6; *Science Scope* has a focus on middle-school science activities; *The Science Teacher* has a focus on grades 9–12; and the *Journal of College Science Teaching* has a focus on post-secondary areas. All the magazines contain a large number of technology-enhanced science articles and may be found on their website (<http://nsta.org>).

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The American Association for the Advancement of Science, (www.aaas.org), is an international non-profit organization dedicated to advancing science around the world.

It was founded in 1848, and serves some 262 affiliated societies and academies of science, serving ten million individuals. As part of its goal to foster education in science and technology for everyone, it has developed a technology initiative called Science Netlinks. Science NetLinks provide a wealth of resources for K-12 science educators, including lesson plans and reviewed Internet resources. At the heart of Science NetLinks are standards-based lesson plans, resources, benchmarks, and tools. These resources incorporate reviewed Internet sites and can be se-

lected according to specific benchmarks and grade ranges. Lessons are tied to at least one learning goal and use research-based instructional strategies that support student learning. The lessons include student-ready materials such as student online worksheets that enable students to engage directly in Internet activities.

INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION (ISTE)

ISTE, the International Society for Technology in Education, through its magazine *Learning & Leading with Technology*, publishes a regular monthly column called "In the Curriculum." Many of these articles describe efforts at integrating science with the tools of modern learning technology. Some of these recent technology-enhanced science articles (which may be viewed at www.iste.org) include: "Real NASA Inspiration in a Virtual Space" (Peterson, Starr, and Anderson 2003); "Breeding Mice the Easy Way" (Bell, Yam, and Bell 2003); "Geometry in Space and The Handheld Computer as Field Guide" (Thomas, Emert, and Thomas 2002); "Geography is Everywhere" (Alibrandi 2002), and "El Nino Did It—Using technology to Assess and Predict Climate Trends" (Niess, Bell, and Bell 2001/2002).

TERC

Founded in 1965, TERC is a not-for-profit education research and development organization. It is based in Cambridge, Massachusetts. TERC's mission is to improve mathematics, science, and technology teaching and learning through activities such as: creating curricula and other products in order to better understand learning and teaching; designing and testing exemplary models of professional development; developing applications of new technologies; and supporting school reform through research and technical assistance. By 2002, TERC programs and products reached nearly two million students in all fifty states and eighty-seven countries.

One of TERC's more innovative projects was the National Geographic KidsNet program. In this project, elementary-school children performed investigations on acid rain and water quality and communicated their findings via email with other schools and with scientists. A second Internet-supported ac-

tivity was called the Global Laboratory Network. This project had students collecting and electronically sharing data regarding ozone levels, soil temperature and moisture content, ultraviolet radiation, bird and insect presence, and other “earth” variables. Details on all of these activities can be found on TERC’s website at www.terc.edu.

CONCORD CONSORTIUM

The Concord Consortium is a tax-exempt, non-profit education, research, and development organization. The work of the consortium (www.concord.org/) is rooted in their belief that the appearance of new, emerging technologies has the potential to ignite explosive strides in learning capacity and curriculum development and that by harnessing these technological resources a powerful extension of educational resources can be available to all people, regardless of their circumstances. The Concord Consortium committed itself to developing and using the best in educational technology. As described on their website, a sample of some of the current technology-science projects would include:

- Data and Models: Weather, Climate, and Global Change—a project that uses advanced data and simulation technology to help seventh and eighth grade students link data to computer modeling and simulations tools.
- Making Thinking Visible—a collaborative project that focuses on developing Web-based materials for middle-school and high-school earth science, specifically plate tectonics.
- Modeling Across the Curriculum—a five-year research project to study the impact of computer modeling tools on secondary-level science learning.
- Molecular Workbench—a project utilizing atomic-scale models to relate a wide range of macroscopic physical, chemical, and biological phenomena to basic properties of atoms and molecules and their interactions.
- TEEMSS (Technology Enhanced Elementary and Middle School Science)—a long-term initiative at the Concord Consortium to infuse computer-based data collection and analysis across the elementary and middle school science curriculum.

CENTER FOR IMPROVED ENGINEERING AND SCIENCE EDUCATION

CIESE is the Center for Improved Engineering and Science Education. It was established in 1988 at Stevens Institute of Technology to help bring the Institute’s technology experience to the K-12 sector. Since 1994, CIESE has developed Internet-based lessons that exploit the unique and compelling aspects of this technology. The lessons focus on the use of real-time data and global telecollaborative projects and engage students in authentic science investigations in which they perform experiments, collect and record real data, and make predictions. In effect, they become real scientists. Through email and other Web-based forums, students communicate and collaborate with other students and scientists around the world. A current list of some of their projects includes: air pollution (a study of ground-level ozone); navigational vectors (tracking plane flights); the stowaway adventure (tracking cargo ships at sea); and the Gulf Stream voyage (an investigation of this large ocean current). (www.k12science.org).

SCIENCE PORTALS

Portals are searchable databases of specialized subjects created for finding verified sources of disciplinary knowledge. The National Science Digital Library (NSDL) is a sample of a portal containing science resources. NSDL is a National Science Foundation (NSF) website (www.nsdl.org). NSDL is a digital library of exemplary resource collections and services, organized in support of science education at all levels. NSDL describes itself as an emerging center of innovation in digital libraries as applied to education, and a community center for groups focused on digital-library-enabled science education. It is a comprehensive, online source for science, technology, engineering, and mathematics education. The NSDL defines its mission: to deepen and extend science literacy through access to materials and methods that reveal the nature of the physical universe and the intellectual means by which we discover and understand it. The NSDL offers free science-related resources to the public, including text, graphics, interactive video, links, and other resources pertinent to computing, engineering, global mapping,

physics, mathematics, earth science, paleontology, and more. By 2007, the site will house the largest collection of science-related material available on the Internet, and it will include three subportals (niche portals) that include Using Data in the Classroom, NSDL Educators Portal, and Science Pictures. The digital library opened to the public in December 2002.

ONGOING SCIENCE PROJECTS

GLOBE is one of a number of major Internet-supported science projects (www.globe.gov). It is a worldwide hands-on, primary and secondary school-based science education program. GLOBE began in 1995 and was administered by a federal interagency program supported by the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the Environmental Protection Agency (EPA) and the U.S. State Department, in partnership with colleges and universities, state and local school systems, and nongovernment organizations.

In 2003, the University Corporation for Atmospheric Research (UCAR), in partnership with Colorado State University (CSU), was officially awarded a Cooperative Agreement from NASA and assumed primary responsibility for the continued development and administration of the GLOBE Program.

Internationally, GLOBE is a partnership between the United States with over one hundred other countries. Over a million primary and secondary students in more than 15,000 schools have taken part in the program and more than 25,000 teachers have been GLOBE-certified. (Teachers and other educators who wish to lead students in GLOBE activities need to attend special workshops in order to fully participate in the program).

For students, GLOBE provides the opportunity to learn in a number of ways. Students, working alone, or in small teams take scientifically valid measurements in the fields of atmosphere, hydrology, soils, land cover, and phenology. They share their data through the Internet. An interactive website allows students to create maps and graphs, analyze data sets, and collaborate with scientists and other GLOBE students around the world.

For teachers, GLOBE provides assistance through professional development workshops. They are given extensive teacher's guides, "how-to" videos, and other materials. Teachers receive support and con-

tact from a Help Desk that includes scientists, and other teachers and partners.

GLOBE-trained teachers help students improve their achievement in science and math and in the use of computer and network technology. Through GLOBE activities, teachers and students achieve state and local education goals and standards and increase student awareness of their environment. GLOBE improves student understanding of science by involving the students in performing real science—taking measurements, analyzing data, and participating in research in collaboration with scientists. Through these activities, GLOBE hopes to expand the number of potential future scientists and researchers.

The JASON Project is an example of a cross-curriculum study that includes elements from the natural and social sciences. Since 1989, JASON Project expeditions have involved students and teachers in current research that have taken their minds and imaginations to some of the most exciting places on Earth—and even to the very outer limits of our solar system. The JASON website at www.jasonproject.org describes some of the projects created and explored over the past fifteen years: The first expedition was called JASON I: The Mediterranean Sea. In May 1989, the JASON Project discovered the first hydrothermal vents in the Mediterranean Sea, examined an ancient Roman shipwreck, and retrieved artifacts from depths of 2,100 feet. The most recent expedition was called JASON XV: Rainforests at the Crossroads. This project engaged students and teachers in an exciting journey of discovery to explore the Isthmus of Panama region and its fascinating tropical rainforests. Project teams explored the unique role the Isthmus of Panama and its tropical rainforests play in furthering the global understanding of the interchange between Earth's dynamic systems. The team focused on the research, monitoring, and management of this region to better understand how it functions and how it changes through time. The team also looked at how human technology has influenced the geography, hydrology, and biology of Panama, and how technology is used to better understand how the world works. Titles of other expeditions in the Jason project include JASON II: The Great Lakes; JASON III: The Galapagos Islands; JASON IV: Baja California Sur; JASON V: Planet Earth; JASON VI: Island Earth; JASON VII: Adapting to a Changing Sea; JASON VIII: Journey from

the Center of the Earth; JASON IX: Oceans of Earth and Beyond; JASON X: Rainforests—A Wet & Wild Adventure; JASON XI: Going to Extremes; JASON XII: Hawaii: A Living Laboratory, Online Expedition: Humpback Whales and Hawaii's Mountain Streams; JASON XIII: Frozen Worlds; and JASON XIV: From Shore to Sea.

SCIENCE SOFTWARE: GEOGRAPHICAL INFORMATION SYSTEM (GIS)

A Geographical Information System (GIS) is dynamic mapping software that links information about where things are with information about what things are like. GIS is also a system for acquiring, presenting, and interacting with spatial data. GIS experts also describe GIS as a system for storing, updating, displaying, analyzing, and manipulating spatial data. GIS is used to answer geographic questions in a variety of formats including maps, charts, and graphs.

A digital map created by GIS will have points that represent features on the map such as cities; lines that represent features such as roads; and polygons that represent features such as lakes. The difference is that this information comes from a database and is shown only if the user chooses to show it. Each piece of information in the map sits on a layer, and the users turn on or off the layers according to their needs. One layer could be made up of all the roads in an area. Another could represent all the lakes in the same area. Yet another could represent all the cities (Environmental Systems Research Institute 1995, 1996).

GIS represents the digital tool most appropriate for helping students meet the six major themes of the national geography standards: the world in spatial terms; places and regions; physical systems; human systems; environment and society; and the uses of geography. A listing of the eighteen geography standards can be found at the National Council for Geographic Education website (www.ncge.org/).

DIGITAL SCIENCE PROBES: MICROCOMPUTER-BASED LABORATORY (MBL)

Digital science probes are used for real-time, computer-based data collection in science and math. A

probeware system is a combination of hardware-interface, probes, and accessories; installed software; and a curriculum specifically designed for probeware experiments. The curriculum is used by teachers and students to conduct experiments that require some type of scientific measurement. These measurements include phenomena such as temperature, light, distance, motion, pH, and force.

In a lab equipped with a desktop or laptop computer, students use the probes to collect and analyze data from science experiments. The data from these measurements is processed by the interface and graphically displayed by the software. Using the software, students instantly see the results of an experiment. Digital probeware is available for use from elementary through college levels in all areas of science including Physical Science, Earth Science, Life Science, Physics, Chemistry, Biology, and Technology. One of the providers of probeware is TeamLabs (www.teamlabs.com).

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INSTRUCTIONAL TECHNOLOGY: THE NEAR FUTURE

The year 2001 marks the beginning of the second twenty-five year period of using modern learning technologies in the classrooms. Innovation in telecommunication technologies, implementation of student and teacher preparation standards, and new roles for the technology-using student and teacher will provide the evolving framework over the next several years.

On the technology-communications side, these trends are worth noting:

1. Rapid evolution of networking.
2. Easier student access to more powerful technology.
3. New ways to search the World Wide Web.

On the changing roles for technology-using students and teachers, there will be a transition from passive to active classroom behavior. Technology-rich experiences across the curriculum will require students

to assume new roles, moving from “fact learners” to designers, collaborators, and worldwide communicators. Teachers will move from information dispensers to interaction developers.

COMPUTER AND COMMUNICATIONS TECHNOLOGIES: ACCESS

New and expanded developments in communication technologies will drive much of the innovation in this decade. In particular, the “transitional new” technologies will include wireless fidelity (Wi-Fi) access to existing networks including the Internet, and low-cost network expansion options. This wireless access uses radio frequency (RF) signals that enable properly equipped computing devices to send and receive data from certain access points, usually within a range of one hundred meters. Wireless access leaves you free to roam with a laptop or handheld computing device while connected to the Internet at high speed, including downloading and printing documents and other files. The wireless standard known as 802.11b already provides untethered network access for many students and teachers, both within and near school buildings. Emerging wireless technologies such as 802.11g offer five times the speed, and WiMax, the promise of improved range, perhaps as far as thirty miles.

Rural communities and schools serving over sixty million people in the United States currently have limited or no access to the Internet. New technologies and initiatives by public agencies and private firms are coming to the aid of those disenfranchised by distance. Satellite access to the Internet, already available to consumers through products such as Directway from DirectTV, utilizes satellite technology to send and receive the Internet to a computer, making it available everywhere in the continental United States. Other firms, with names like WildBlue Communications, are now entering this market, promising lower-cost and higher-speed connections. Similar to efforts in the past to build rural electric and telephone service, the federal government is also stimulating development of rural broadband access. For example, in 2003, the Agriculture Department announced its first major rural broadband effort, including a \$1.5 billion loan program to encourage high-speed Internet deployment. Time and place constraints of formal learn-

ing will be further challenged, and these emerging connection technologies will help bridge the rural digital divide. Communications will include true broadband wireless transmission, permitting seamless reception and transmission of video, sound, and text files. The era of anytime/anywhere access to learning will be at hand.

Peer-to-peer (P2P) networking allows individuals to create ad hoc networks within a local area network (LAN) or across the Net. In 1999, eighteen-year-old college student Shawn Fanning invented Napster as a tool to find and share music files between individual PCs. P2P is used today primarily for swapping digitized music files among millions of PCs (in most cases, illegally). However, this same technology could also be used for exchanging academic content and encouraging collaboration. As Andy Oram (2001), authority on peer-to-peer networks, describes it, “Academic environments are ideal for experimenting with peer-to-peer and benefiting from peer-to-peer. You have an open attitude toward information, well-educated staff who can adapt to new tools, a variety of projects that require information exchange, and a willingness to expend time and effort in order to save money.” With support from the Mellon foundation, researchers at Penn State, MIT, Simon Fraser University, and the Internet2 P2P working group are developing LionShare. The LionShare P2P project is an effort to apply peer-to-peer technologies to an educational environment in support of teaching, learning, and research.

Internet2 is a not-for-profit consortium of over two hundred U.S. universities, over sixty corporations, and some three dozen other organizations, that is developing and deploying advanced network applications and technology, creating tomorrow’s Internet. Although Internet2 is largely a dedicated physical network, it will develop new technologies and capabilities that can then be deployed in the global Internet. The associated Internet2 K20 Initiative aims to bring together as quickly and as connectedly as possible, primary and secondary schools, colleges and universities, libraries, and museums. Their goal is rapid deployment of new technology applications and the content of innovators, from across all educational sectors in the United States. More than a faster Web or improved email, these new technologies will enable completely new applications such as

vast digital libraries, virtual laboratories, and distance-independent, media-rich learning. One such highly sophisticated technology is virtual reality, a computer-controlled environment where users experience sensory immersion and can interact with objects much as they might in the real world. Virtual reality (VR) can also allow people to experience situations not possible in reality, such as visiting an ancient civilization or touring the human circulatory system. One fledgling VR application found in schools today and popular on the Web is the virtual field trip. However, high-performance VR is expensive to develop and relies on highly specialized equipment and network connections. Connections on the Internet2 can run up to 2.4 gigabits per second, about 45,000 times faster than a typical 56K dial-up modem, and one hundred to one thousand times faster than typical broadband connections. Internet2 also solves other limitations of the current Internet. Today, even when research sites have high-speed connections to the Internet, they are dependent on the quality of the intermediate servers and other devices, and the speed of the linked site. Another limitation is the sheer number of users on today's Internet. Once the Internet became commercialized and widely available to the public, increasing numbers of people demanded more and more bandwidth. Burgeoning numbers of cable modems and DSL services are adding to the congestion, as end users now share and download even larger media files. Internet2 has dedicated, data paths used primarily for research purposes, and is not congested by the billions of email messages, music files, and video clips that pass through other connections.

Other transitional new technologies include a shift from keyboard input to handwriting recognition systems. The Apple Macintosh OS X operating system already includes the aptly named application "Ink" for handwriting recognition. When Ink is turned on, you can use a graphics tablet and stylus to print text that the computer recognizes and converts to words. You can write any time you're using your stylus and the computer automatically recognizes what you've written. Microsoft and many laptop computer makers now offer the Tablet PC, the equivalent of an electronic legal pad. Tablet PCs come with a special stylus that you use to "write" on the same screen used for display. The handwriting recognition on the Tablet PC works based on your natural writing, ac-

cepting printing and handwriting. The operating system actually stores the handwriting as a graphic and the converted text in the notepad application. You can go back and forth between the handwriting and the converted text, helpful for items that the recognition software may have misinterpreted. While today's computer handwriting recognition systems are far from perfect, they offer compelling alternatives to keyboarding.

COMMUNICATIONS TECHNOLOGIES: SEARCHES AND GATEWAYS

The Web will continue to be searched with a variety of well-maintained and upgraded generic search engines. The term "search engine" describes both software (crawler-based or spider-based) search engines and human-powered directories. Search engines gather their listings in different ways. The crawler-based search engines create their listings automatically by "crawling" or "spidering" the Web. People search through the listed results. A human-powered directory depends on humans for its listings. A search looks for matches only in the descriptions submitted for the Web page. The Open Directory, formerly called NewHoo, and acquired by AOL Time Warner, is a directory-based search engine. Open Directory (<http://dmoz.org/>) describes itself as the most comprehensive human-edited directory on the Web. Directories are often developed and maintained by a large global community of volunteers.

According to 2003 statistics by SearchEngineWatch (<http://searchenginewatch.com>), four search engines were the most heavily used: Google (www.google.com), Yahoo (www.yahoo.com), MSN Search (<http://search.msn.com>), and AOL Search (<http://aolsearch.aol.com>) (internal) or (<http://search.aol.com/>) (external). Each of these search engines had over five million search hours per month.

In the near future, Web searches will be accomplished by search engines that use artificial intelligence. These intelligent agents will change the information repository of the World Wide Web into a true knowledge machine. Learners of any age or sophistication will be able to make productive inquiries of this worldwide knowledge base. The answers to their inquiries will be delivered in a cognitively and age-appropriate context in a multimedia format that will include text, charts, graphs, sound, and video.

New educational gateways or portals will be developed and existing ones will be expanded. GEMS, for example, is the Gateway to Educational Materials. GEMS is a consortium of more than four hundred organizations and individuals that provide a substantial collection of Internet-based educational materials available on various federal, state, university, non-profit, and commercial Internet sites. GEMS is a project of the U.S. Department of Education, located at the Information Institute of Syracuse at Syracuse University.

The Federal Resources for Educational Excellence (www.ed.gov/free) is a website maintained by the federal government. Over twenty-five federal agencies and organizations contribute to a huge database of information and provide access to a wide range of academic subjects including Arts, Educational technology, Foreign languages, Health and Safety, Language arts, Mathematics, Physical Education, Science, Social Studies, and Vocational education.

CHANGING ROLES FOR TECHNOLOGY-USING TEACHERS AND STUDENTS

According to the National Center for Educational Statistics, by the fall of 2002, virtually all public schools were connected to the Internet, and 92 percent of the instructional rooms in schools had Internet access. The Pew Internet & American Life Project offers additional insights concerning student use of the Internet. More than one in five households with children now have broadband Internet access, most through cable modems and digital subscriber line (DSL) service through their phone company. This broadband access encourages wider use of multimedia resources. Many students don't use the Internet much at school due to poor connections, blocking and filtering software, and restrictions imposed by teachers on what websites they can visit. The same Pew survey found many students use the Internet not only for reference but also for online chat, including seeking direct help from peers with schoolwork. Some 54 percent of schools rely on students for technical support, and 4 percent rely on students for technology training for teachers.

These technology-savvy students, under the guid-

ance of reform-minded teachers, will assume new roles, moving from passive-fact learners to active designers, collaborators, and worldwide communicators. Wireless technologies and intelligent agents will allow students to be learners at any time, anywhere.

FORECASTS

Given the widespread impact of digital technology in all sectors of society, and the more thoughtful ways we evaluate its educational effectiveness, computers, the Internet and other digital media will likely bring about more significant and sustainable changes than the technologies that preceded them. These changes will likely include:

1. Students having routine access to more computing power both in the schools and in their homes, using portable wireless devices that connect to computer networks across the globe.
2. Teachers and media specialists evolving from conduits for prefabricated sources to coaches and guides for technology-based, media rich, information repositories.
3. Students as more active and collaborative learners, enjoying wider access to more experienced members of society beyond the classroom.
4. Computers evolving from isolated, desktop machines to more portable, networked devices. Computer networks will not only connect more learners to growing online public resources, they will also increasingly connect one peer to another to share personal conversations and private creations.
5. Technological developments in handwriting and voice recognition will make the student-computer interface more intuitive, efficient, and effective.
6. Developments in computer power will support and strengthen media consolidation and convergence. Information will be accessed and retrieved in new combinations of text, graphics, sound, and video. These new hypermedia products will allow students a more powerful way to interact with search engines and data sources.
7. Teachers will have access to a new suite of integrated classroom management tools, including learning plans tailored to individual students, the digital equivalent of today's individual education programs (IEPs) for special education students. The

prudent use of these tools will permit teachers to create context-appropriate learning environments for all students.

8. Boundaries separating schools from each other, from the home, and from other community agencies will dissolve. Some social-human activities will take place in face-to-face meetings between a teacher and groups of students. Other schooling will be technology-enhanced, including distance learning, digital-supported informal learning, and school-home-library connections.

These educational technology forecasts represent a consensus among experts that schooling, influenced by digital technologies, will continue to change dramatically over the next twenty-five years. All the main components—curriculum, instruction, evaluation, and teacher preparation will be under extreme pressure to adapt to these powerful tools. There is a great need for careful, humane, and strategic planning among all stakeholders in our educational enterprise.

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- Center for Improved Engineering and Science Education: <http://k12science.orgtech.edu/index.html>.
- Concord Consortium: www.concord.org/.
- Consortium for School Networking (CoSN): <http://cosn.org/>.
- Education Week On the Web: www.edweek.com/sreports/.
- eMINTS: <http://emints.more.net/evaluation/reports/>.
- From Now On: The Educational Technology Journal: <http://optin.iserver.net/fromnow/>.
- GLOBE Project: www.globe.gov.
- How Stuff Works: <http://computer.howstuffworks.com/ethernet.htm>.
- Internet2: www.internet2.edu/.
- ISTE (International Society for Technology in Education): www.iste.org.
- JASON Project: www.jason.org.
- McGrath, Diane, PBL website: <http://coe.ksu.edu/PBL/>.
- McREL (Mid-continent Research for Education and Learning): www.mcrel.org/.
- Milken Exchange on Education Technology: www.milkenexchange.org/.
- Multimedia Project: <http://pblmm.k12.ca.us/PBLGuide/PBL&PBL.htm>.
- NASBE (National Association of State Boards of Education): <http://www.nasbe.org/>.
- National Council for the Social Studies: www.ncss.org/.
- National Council of Teachers of Mathematics: www.nctm.org/.
- National School Boards Association: Education Technology: www.nsba.org/site/page_micro.asp?TRACKID=&CID=63&DID=195.
- NCGE (National Council for Geographic Education): www.ncge.org/.
- NCREL (North Central Regional Educational Laboratory), NCREL: Technology Integration: www.ncrel.org/tech/qkey3.
- NCREL (North Central Regional Educational Laboratory): www.ncrel.org/tplan/cbtl/toc.htm.
- Networking 101, Networking Basics: <http://compnetworking.about.com/cs/basicnetworking/>.
- Networks for Beginners: www2.rad.com/networks/1997/nettut/mainmenu.html.
- NSDL (National Digital Science Library): www.nsdl.org.
- NSTA (National Science Teaching Association): www.nsta.org.
- NSTA, Institute. <http://institute.nsta.org>.
- NSTA, SciLinks: www.scilinks.org.
- Open Directory: <http://dmoz.org>.
- Pew Internet & American Life Project: www.pewinternet.org.
- Rubistar: <http://rubistar.4teachers.org/index.php>.
- SearchEngineWatch: <http://searchenginewatch.com>.
- Software & Information Industry Association: www.siiia.net/.
- TeamLabs: www.teamlabs.com.
- TERC: www.terc.edu.
- Tom's Networking: NeedtoKnow Index: www.tomsnetworking.com/NeedToKnows.php.
- Webquest page: <http://webquest.sdsu.edu/taskonomy.html>.
- WhaleNet Site: www.whalenet.org.
- WIPs (Web Inquiry Projects): <http://edweb.sdsu.edu/wip/>.

WEBSITE RESOURCES

American Association for the Advancement of Science: www.aas.org/.

II

PHILOSOPHICAL, SOCIAL, AND POLITICAL ISSUES IN EDUCATION

PHILOSOPHY OF EDUCATION

As a formalized, academic discipline, philosophy of education is quite young. The first course in philosophy of education in the United States may have been Nicholas Murray Butler's (1862–1947) course in the 1890s and 1900s at Columbia University. Butler taught “Principles of Education,” using as textbooks Paul Hanus's (1855–1941) *Educational Aims and Educational Values* (1899) and Harrell Horne's (1874–1946) *Philosophy of Education: Being the Foundations of Education in the Related Natural and Mental Sciences* (1904) (Johnson 1995, 5). It is also during this period that we begin to see the University of Chicago, Clark University, Columbia, and New York University producing doctoral dissertations on topics in philosophy of education. Another important date in the history of the discipline is 1916, when John Dewey (1859–1952) published what has since become the signature work of the field: *Democracy and Education: An Introduction to the Philosophy of Education*. Despite these early benchmarks, though, it was not until 1941 that the Philosophy of Education Society was founded, and not until 1951 that *Educational Theory*, the society's academic journal, was established. Indeed, according to some scholars it was not until the mid-1960s that philosophy of education finally gained a firm foothold in the academy (Blake et al. 2003, 2).

In an important sense, however, it is misleading to think of philosophy of education as a young field. As a domain of inquiry, educational philosophy is as old as philosophy itself. Educational questions are central to the work of founding figures in Western and Eastern philosophy alike. In Plato (427–347 B.C.E.), for instance, we find discussions of what we would now call moral, civic, and vocational education respectively. We find curricular proposals regarding the arts and physical education, inquiries into the nature of teaching and learning, and illustrations

of the educative potential of dialogue and the unique pedagogical approach of Socrates. Similarly, Confucius (551–479 B.C.E.) concerns himself as much with learning and what it means to be a student as he does with righteousness and filial piety.

The point is not to show that we have a long history of applying philosophy to education, but rather that no application was deemed necessary until very recently in intellectual history. For more than two millennia after Plato, educational questions remained central to philosophical inquiry in the West. For thinkers as diverse as Cicero (106–43 B.C.E.), Augustine (354–430), Boethius (480–524), Thomas Aquinas (1224–1274), Erasmus (1469–1536), Giambattista Vico (1668–1744), Jean-Jacques Rousseau (1712–1778), or Friedrich von Schiller (1759–1805) education was not an extraneous topic calling for philosophical afterthoughts, but the very ground of their most important philosophical inquiries. Until recently, it has seemed natural for philosophers to take up questions about knowledge by examining how we come to know; to consider questions about the good life by investigating how one becomes virtuous; to approach the nature of the ideal society through a discussion of how to educate future citizens; and to contemplate human nature by asking what it means about us that teaching and learning are such a fundamental aspects of the human condition.

By the time philosophy joins the ranks of formalized, academic disciplines at the end of the nineteenth century, however, it has undergone a series of significant transformations. It has abandoned its traditional task of articulating and exemplifying a way of life that can guide human conduct in favor of constructing systematic theories (Hadot 1995). Further, it has ceded to the newly emerging social sciences its traditional concern with the developing person and with social practices such as education. Thus, when

philosophy and education are reunited in the modern discipline of philosophy of education, it is in a doubly alienated way. As an applied subfield, philosophy of education is thought to stand at a remove from “pure” philosophy, which in turn is thought to stand at a remove from the practical and the everyday. In order to introduce the reader to the full scope of educational philosophy, then, it will be necessary to survey not only modern scholarship in the field but also a variety of humanistic works which predate the field as such.

Some might wonder why we should concern ourselves with this older tradition even if it does exist. After all, why not simply present the latest research, the state of the art? Though it is doubtful that even the sciences progress in such a linear fashion, this is certainly not the case in the humanities. Humanistic scholarship is closer in form to an ongoing conversation than to a series of experiments and results. Conversations progress, and some conversations are better than others, but it does not make sense to ask for the results of a conversation. The final word in a conversation is no more valuable than the others, all of which are to be judged together on whether they enlarge our understanding, deepen our sympathies, sharpen our perceptions, and improve our judgment. Books such as Plato’s (1992) *Republic* and Rousseau’s (1979) *Emile* cannot become outmoded, only forgotten. As times change, individual aspects of such works may come to strike us as silly or offensive, but as a whole each of these works remains a high point in our attempt to think through imaginatively, systematically, and unflinchingly the nature of education and its place in human life. Texts such as these seldom offer clear answers to our current stock of questions, but they provide an even more valuable service. They help us to see how our current questions fail to get at the heart of the matter. They show us how to ask more interesting, important, and insightful questions.

In this way, philosophy of education differs from much of educational research. Typically, educational research is undertaken with the aim of establishing what works in practice so that these findings may be transmitted to practitioners and policy makers. The point of educational philosophy, in contrast, is to transform those involved in educational policy and practice. It aims to help us to think more deeply about educational questions and more critically about edu-

cational initiatives. Philosophy of education invites educators into the more than 2000-year-old conversation into the nature and purpose of education. This not only helps us to see beyond the confines of current debates, but it reminds us why we care about education in the first place.

ORGANIZATION OF THE CHAPTER

This chapter is divided into four entries, each devoted to a core area of inquiry in philosophy and education, old and new. Two of the entries concern the aims of education and two concern the process of education.

For philosophers of education, the aims of education go beyond curricular goals and even beyond the explicit principles of a school mission statement. Implicit in such goal statements are fundamental notions about individual and collective human flourishing. Thus, discussion of the aims of education falls into two broad categories: educational ethics and social (or political) philosophy of education.

Ethics is the study of what constitutes a life well lived. This includes not only questions of right and wrong, but more broadly it concerns what makes a human life excellent, meaningful, or rich. Since education, however it is conceived, involves helping people develop, educators cannot help but rely on more or less implicit notions of what we ought to be developing into. Philosophy of education seeks to make such ideals of the educated person explicit and to evaluate them in light of rival notions of human flourishing. The first entry reviews some of the major developments in this area with special attention to moral education, that branch of educational ethics that deals specifically with how to cultivate in the young the dispositions and capacities, cognitive and emotional, to treat other people well.

Educational theories and practices are not only animated by notions of individual flourishing, but are also informed by our answers to the question, how ought we best to live together? Educational practices are often explicitly justified in reference to social philosophy. An educational initiative is said, for instance, to sustain democracy or to help achieve social justice. Whether or not they are stated explicitly, though, such social visions are always present, guiding the choices of educators and affecting the shape of classrooms. Thus, another central project

for philosophers of education has been examining the ideals of collective human flourishing that animate educational practices and theories. The second entry deals with some of the major figures and currents in social philosophy and education.

The remaining two entries are devoted to the two sides of the process of education, teaching and learning. The third entry, on learning, considers philosophical contributions to questions such as: what does it mean to learn, how do we learn, what is most worth learning, and what does it mean to be a learner or student?

The fourth entry reviews the major philosophical positions advanced around the question, how best should we conceive of teachers and the act of teaching? For example, is teaching a practice, an art, a relationship, a profession, or an applied science? Are teachers best understood as instructors, facilitators, midwives, intellectuals, political activists, or shapers of an environment?

COMPETING SCHOOLS OF THOUGHT

Before turning to our survey of significant developments in these four areas, it is worth saying something here about the diverse modes of inquiry found in the contemporary field. Philosophers of education not only disagree about the nature of teaching, learning, and the aims of education, but they also disagree about how to approach these questions. In other words, the field is characterized by a robust methodological pluralism. It is part of the contribution of philosophy of education to offer specific arguments and conclusions, and also to preserve, articulate, and evaluate various theoretical approaches.

In the first place, philosophers of education differ in their understandings of philosophy, education, and the relationship between them. Two rival understandings of philosophy are found in the analytic approach and the history of philosophy approach. Analytic philosophy is characterized by fine-grained analysis of terms, careful evaluation of arguments, and a direct, ordinary language prose style. In some variants of analytic philosophy, this last quality is sacrificed to the first two activities, which are thought to require a highly technical, formalized language.) Typically, thought, the analytic approach prides itself on avoiding the jargon, inaccessibility, and fuzzy thinking that is typical of some philosophical writing. Modeling itself in part

on the natural sciences, it seeks slow but steady progress on small, well-defined problems, emphasizing the fallibility of its results. As R. S. Peters (1967), one of the founding figures of analytic philosophy of education, once quipped: good writing “has the prime philosophical virtue of being clear enough to be obviously mistaken.”

The history of philosophy approach begins not with a problem but with a text or tradition of thought, assuming that philosophical questions of real interest are inseparable from their articulation in the novel theoretical vocabularies of individual thinkers and philosophical schools. It prizes comprehensiveness of vision over exactness of detail, and depth of insight over irrefutability of argument. It gravitates toward problems based on their significance rather than on how tractable or well defined they are. On this view, philosophy is as much about asking questions as it is about finding answers and the great resource for novel, powerful questions is the canon of historically significant, philosophical texts.

The typical analytic complaint about this approach is that it promotes argument by authority. “It doesn’t matter who said it,” the analyst insists, “what matters is whether or not it is true.” The typical response to this critique is as follows. The truth of a philosophical theory cannot be established by simply comparing its individual claims against brute facts as if we had access to *the* world itself, unmediated by any theoretical presuppositions. Rather, we always deal with *a* world, or the world under a particular aspect. Thus, any rich theory offers its readers such a world, and this world must be inhabited before it can be evaluated. Such evaluation takes the form of testing its internal coherence and comparing it, not against brute facts, but against the explanatory power of rival worldviews.

Meanwhile, the history of philosophy approach has its own concerns about the analytic mode, which it views as making a fetish out of clarity and argumentative rigor. The analytic philosopher, the critique continues, is like the proverbial man looking for his keys under the streetlight—even though he dropped them elsewhere—because that is where the light is. Analytic philosophy is thought to discuss only what can be discussed with a high degree of precision and certainty, leaving philosophy mute on the questions of the greatest importance.

In its pure form each approach runs the risk of turning philosophy into an academic exercise divorced from the stakes and contours of lived life. Analytic philosophy risks becoming an exercise in argumentation and definition, while the history of philosophy approach risks becoming an exercise in genealogy and translation. Good philosophy, it would seem, requires both clarity and depth. In recent years, the tension between these approaches has eased and fortunately one now finds more work that straddles this divide.

There also are debates over how best to understand education and the place of philosophy in relation to education. Some scholars in the field tend to equate education with schooling, arguing that the field is inherently connected with this crucial public institution. Others suggest that it is one of the field's chief responsibilities to offer reminders that schools are but one of many educative institutions and that much of education occurs in informal settings. Thus, some educational philosophers insist that the purpose of the field is to improve schools; others stress our role in teacher education; and still others see philosophy of education as a sphere of basic research that should not be constrained by the immediate needs of schools or demands of teacher education. Meanwhile, some philosophers of education view the field as an application of theory to practice; others question this distinction pointing out that philosophy itself is an educative practice or that the practice of education is itself a form of inquiry and reflection.

Methodological diversity goes beyond understandings of philosophy, education, and their relationship. The field is also characterized by work in competing philosophical schools such as: pragmatism, critical theory, feminism, postmodernism, and hermeneutics.

Pragmatism is a complex philosophical position characterized in part by its view that knowledge claims are best understood by asking what difference they make in conduct, and by its portrayal of human beings as social, problem-solving creatures in interaction with an environment. Pragmatic philosophers of education draw on the founding figures of the movement—such as C. S. Peirce (1839–1914), William James (1842–1910), and especially John Dewey—and on more recent pragmatists, such as Richard Rorty, Hilary Putnam, and Cornel West—to address a variety of educational questions.

Critical theory is a broad term denoting social philosophy indebted to Karl Marx's (1818–1883) analysis of class struggle, and especially that related to Frankfurt School figures such as Theodor Adorno (1903–1969) and Jürgen Habermas. Critical educational theorists investigate the ways in which schools reproduce relationships of domination. A major strand of critical educational theory is critical pedagogy, the movement inspired by the work of Paulo Freire (1921–1997), whose most famous work is *Pedagogy of the Oppressed* (1970). Critical theory and critical pedagogy are discussed in greater detail in the Social Philosophy and Education entry later in this chapter.

Feminist philosophy of education began with the pioneering work of Jane Roland Martin (Rice 1999). In *Reclaiming a Conversation: The Ideal of the Educated Woman*, Martin (1985) strives to recover a neglected tradition of women's educational thought, and to question the masculine bias inherent in our ideals of the educated person. Other work in this area has dealt with notions of caring and mothering, with contesting the public-private distinction, and with providing a feminist account of teachers' authority. Feminism is not mutually exclusive with the last two categories discussed. Indeed, some works, such as Maxine Greene's (1988) *Dialectic of Freedom*, would be an example of all three.

Postmodernism is a broad term naming a number of related developments over the last several decades in Western philosophy, art, and everyday life. A central feature of postmodernism is our increased skepticism toward grand narratives of progress—whether religious, scientific, or political—and distrust of claims to objectivity. Postmodern philosophers argue that knowledge claims are shaped by the historical, cultural, and social location of their authors. They emphasize the contingency, partiality, and multiplicity of interpretations against the claims of reason to establish universal ideals or objective facts. Postmodern philosophy of education takes many forms. Some educational philosophers have looked at education itself as another grand narrative, noting how the educational project seems inseparable from a belief in the perfectibility of human beings and a faith that through education the future will be better than the past. Scholars such as Nicholas Burbules (1996) have asked what education might look like if we traded in this faith in our educability and steady educational progress for a more skeptical postmodern

stance. Other writers have applied this postmodern doubt to specific educational concepts. A postmodern critic might attempt to show, for example, that what seem like indisputable facts about the nature of intelligence or adolescence are actually fallible human interpretations embodying particular purposes and contingent histories.

The term “hermeneutics” refers to the art or science of interpretation. Many discussions of hermeneutics are tied to specific types of texts so that we might speak of biblical or legal hermeneutics. Philosophical hermeneutics is the general study of the nature of interpretation and understanding. For more on philosophical hermeneutics, see the discussion of Hans-Georg Gadamer in the Concepts of Learning and Theories of Knowledge entry. If, as a general rule, critical theory and postmodernism approach an object of interpretation in a suspicious manner, asking what it hides, hermeneutics insists that interpretation requires a receptive stance toward the object, asking what it is trying to say to us. Hermeneutics understands tradition as something to be understood and renovated, not as something to be embraced uncritically or fully rejected. Indeed, on the hermeneutic view, talk of the rejection of tradition is empty since it is tradition that furnishes us with the resources for critical understanding. One of the specific methodological principles in this approach is the hermeneutic circle, which states that understanding of the whole requires an understanding of the parts, but that understanding of the parts also requires understanding of the whole. This means that good interpretation requires a patient shuttling back and forth between tentative conclusions about, say, the overall meaning of a text and the meaning of its parts.

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ETHICS AND MORAL EDUCATION

From its earliest beginnings, philosophy of education has been inextricably connected with ethics. Socrates (c. 470–399 B.C.E.), one of the founders of the discipline, was chiefly concerned with the virtues. Plato (c. 438–348 B.C.E.) outlined two large-

scale educational systems in *The Republic*, but his main theme was ethical, namely: “What is justice?” Similarly, the *Moralia* of Plutarch (c. 45–125) opens with an essay on the education of children, and continues with lengthy discourses on the various virtues and how best to inculcate them. Latin writers on pedagogy followed suit. The *Institutio Oratoria* of Quintilian (c. 35–95) is a primer for the education of a Roman orator and rhetorician, beginning in childhood, yet the author maintains that “if the perfect orator had existed in some epoch, there would be no need to apply to the schools of the philosophers for the precepts of virtue.” The orator is a man skilled in speaking but also “perfect in morals” (Quintilian 2001, 61). Non-Western traditions similarly trace the beginnings of educational theory to moral texts: the Hindu Upanishads, the Buddhist Suttas, the Analects of Confucius, and the like. The great teachers of antiquity, whether religious or secular, were invariably teachers of ethics.

The thrust of all early theories of education, when formalized as such, was *character formation*. In Ancient Greece, this was called *paideia*, and was thought by Plato and Socrates to be accomplished through inquiry into the nature of the virtues and of virtuous behavior. For Socrates in particular, any such inquiry inevitably revealed that deeper, more profound contemplation was necessary. Education meant moral examination of one’s own life: ultimate personal well being was only possible through sustained training of reason, the intellectual capacity to seek out and apprehend the good. Aristotle (348–322 B.C.E.), on the other hand, recommended that children be put in the care of virtuous tutors, who would inculcate habits of virtuous action. The young man’s character would be formed by his repetition of these habitual patterns in situations calling for their exercise. Later, in religious communities, character formation was thought to proceed through careful attention to the dictates of authoritative texts, such as the Bible or the Koran. Still, despite their differences, ancient philosophies of education made moral education central and primary.

In the Christian West, the doctrine of original sin colored all educational thought before the renaissance. Man was defined as a fallen being, his inmost nature a great wickedness, redeemable only by the saving power of Christ. Moral authority (and therefore educational authority) derived from God.

Education operated under the auspices of the church, and its chief goal was salvation. Pedagogy was routinely evaluated from a doctrinal standpoint, and judged in terms of its perceived affinity for (or hostility to) the prevailing orthodoxy. Even Christian Humanists such as Erasmus (c. 1466–1536) did not dispute the ultimate authority of scripture (McConica 1991).

For this ethical stance to change, an entirely new, secular theory of human nature was required. Renaissance humanists had planted its seeds, but only after the Reformation did it have fertile ground in which to grow. In the work of Jean-Jacques Rousseau (1712–1778) we find it in full flower. In *Emile*, Rousseau (1979) casts the young child as “naturally” free, noble and compassionate—a view that, as the Archbishop of Paris rightly recognized, denies original sin. As opposed to the positive character formation of religious and classical educators, early education under Rousseau’s theory is primarily negative. It holds off on inculcating any moral rules or dicta, and instead seeks to shield the child from the vices and errors propagated by society. In this way, Rousseau felt, the child could grow up morally autonomous, self-loving without being selfish. The teacher’s role was to protect the child’s freedom and goodness from social depredations, a substantial, active task of constant watchfulness and no little censorship.

The larger ethical concerns of the Enlightenment were based in skepticism about the roots of moral authority. How was ethics possible without the grounding of religious truth? Several answers were proposed: morality could be based on obedience to laws inherent in human nature, on social contract theory, on conceptions of duty, on an analysis of social and political institutions, or on a calculus of the greatest happiness for the greatest number. But the philosophers who put these theories forward—David Hume (1711–1776), Immanuel Kant (1724–04), G. F. Hegel (1770–1831), J. S. Mill (1806–1873), and their contemporaries—wrote little on education *per se*. Enlightenment ethicists were concerned with finding new foundations for morality, not with the process of character formation in individual students. A distinct break had occurred. Talk about the good had turned away from talk about *learning* to be good. Moral philosophy had lost its intimate connection with educational theory.

MORAL DEVELOPMENT AND MORAL EDUCATION

In the late nineteenth century and for most of the twentieth century, philosophically minded social scientists were the main voices on moral education. The French sociologist Emile Durkheim (1858–1917) believed that a child developed morally by internalizing social rules and norms, and that moral education in schools was necessary to achieve this development (Durkheim 2002). Only in the schools could the citizens of a modern state build the rational, consensual morality that would preserve their democratic way of life. While not rejecting this view entirely, Swiss psychologist Jean Piaget (1896–1980) added that certain aspects of a child’s moral structure developed in action, through negotiating, game playing, and testing rules with peers, not merely through attachment to existing adult conventions. Thus, to facilitate moral development, schools would need to provide time and activities for children to develop rules and solve problems on their own (Piaget 1965). As social science, psychology in particular, began to seem like the natural grounding for pedagogy, learning theorists joined their colleagues in child development and developed philosophies of education. B. F. Skinner (1904–1990) and other American behaviorists published notable philosophical texts based on psychological theories (Skinner 1972).

Some of the most lasting and influential work of this nature was done by American psychologist Lawrence Kohlberg (1927–1987). In the early 1970s Kohlberg proposed that moral reasoning developed through six invariant stages, from fear of punishment to action on principle. Progress from one stage to the next was, he believed, possible only under the impetus of discussion, where children could be exposed to reasoning at a higher stage. This led him to develop practical initiatives in moral education, such as one-person/one-vote “Just Community” schools (Kohlberg 1973).

Kohlberg’s work has proved extremely controversial. Some critics feel he was too quick to equate moral reasoning and moral articulation with moral behavior in real-world situations. His theory, they claim, describes not stages of moral development but stages of moral rationalization. Another important line of criticism, beginning with the work of Carol Gilligan (1982), charges that Kohlberg’s theory devalues

moral principles and structures based on relation (such as care and compassion) while overvaluing those based on ideas of impartiality as abstract from social networks or persons (such as justice). Since women and girls tend to use structures of relation in moral analysis more often than men and boys, they are artificially placed “lower” on Kohlberg’s scale, and seen as less mature.

Nevertheless, Kohlberg and his contemporaries (including most of his critics) spoke the same language, that of evidence-based, empirical research, mostly in the field of psychology. They were philosophically minded social scientists who saw their work as scientific, geared toward achieving observable results: moral, or “prosocial,” behaviors. They worked to make character formation into a testable, researchable discipline—moral education—and they developed a rich scientific discourse with which to talk about it. For a time, this way of talking and thinking about moral education was the dominant form of discourse in the field. It remains a familiar model.

THE CONTEMPORARY SCENE

Over the last several decades, philosophers of education have begun to mend the modern rift between moral philosophy and moral education. This renaissance has involved three related developments. First, there has been a resurgence of a distinctly philosophical discourse in moral education. Second, there has been a renewed focus on educational questions in moral philosophy, in part because of the rise of virtue ethics. Finally, recent years have seen the emergence of a new understanding of the practice of teaching as itself a moral endeavor. Each of these developments will be considered separately.

Moral education programs are now routinely justified and criticized on philosophical rather than psychological grounds. There is still a great deal of psychological research on prosocial behavior (Solomon et al. 2001), but this is no longer the dominant paradigm. The Values Clarification curriculum so popular in the 1970s (Raths et al. 1978) faded not so much due to Kohlberg’s persistent psychological critique, but due to its proponents’ failure to defend themselves adequately against widespread charges of moral relativism. The successor to Values Clarification, the Character Education movement, puts itself forward squarely as an attempt to codify

and instill certain virtues (Bennett 1993). Recent curricular reforms developed and popularized by academic philosophers draw on classical as well as modern texts and wrestle with enduring philosophical problems (Lipman, Sharp, and Oscanyan 1980; Adler 1982). We seem to have come full circle back to Socrates.

The psychologically important idea of developmentally “higher” and “lower” stages of moral reasoning is still very much in play, but some forms of moral explanation and discourse, even among young children, are now recognized as *philosophically* interesting. Kohlberg’s understanding of justice is recognizably similar to that of John Rawls (1971). Gilligan’s work on relation (1982) provides the groundwork for Nel Noddings’s (1984) ethic of care, and it has also influenced the writing of moral particularists. (Briefly, moral particularism is the belief that there are no universal moral rules that can, without exception, guide ethical behavior in different situations.) Philosophers do not see either ethical mode as male or female, or as developmentally superior or inferior.

Another important factor in restoring the connection between moral philosophy and moral education has been the recovery of virtue ethics—a new and far-reaching development in moral philosophy. This movement began (Anscombe 1958) as a revolt against moralities of duty and obligation, and equally against those that find good in the consequences of particular acts. It thus opposed both the deontology of Kant and the utilitarianism of Mill. Virtue ethicists are interested, rather, in the habitual dispositions of particular moral agents. Since habitual dispositions are *acquired* traits, the manner of their acquisition becomes important, leading many virtue ethicists to write about moral education. Their findings are various: one notable philosopher in this tradition has determined that moral education is vital (MacIntyre 2001) and yet that the teacher’s job today is impossible (MacIntyre 1987).

In addition to the rise of philosophical discourse in moral education and the revival of virtue ethics in moral philosophy, recent years have witnessed an important new line of research about the inherently ethical nature of the practice of teaching. Here, American philosophers of education have led the way. Combining empirical research with philosophical inquiry, the “Manner in Teaching Project has shown that one essential element of any classroom interac-

tion is the moral disposition and character of the teacher, or the teacher's *manner* (Richardson and Fenstermacher 2001). Similarly, Philip W. Jackson writes that teaching is a moral endeavor, always influenced by a teacher's implicit, stylistic, and indirect expressions of virtue. These virtuous habits, Jackson (1999) claims, are expressed in the mundane, everyday exercise of teaching, not confined to moments where explicitly moral dilemmas are confronted. David Hansen (2001, 1–19) has similarly questioned conceptions of teaching that are outcome-based, or see teaching as a means to an end. Hansen (1995) sees it as a calling or vocation, a transformative moral practice of enriching students' minds and spirits. Such a conception necessarily focuses attention on the teacher's moral self and her situation in a larger tradition (Hansen 2001, 20–40 and 114–192).

Numerous philosophers and researchers have added their voices to this vision of teaching. Along with virtue ethicists and character educators from the political right and left, they are once again making ethics a central theme in philosophy of education.

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SOCIAL PHILOSOPHY AND EDUCATION

There is a close relationship between social or political philosophy (henceforth simply referred to as “social philosophy”) and philosophy of education. Social philosophy concerns such questions as: How should we live together? What kind of society is best? and, What kind of political system is most just? Philosophers since at least as early as Plato (427–347 B.C.E.) have known that creating an ideal social and political order requires educating citizens who will be capable of realizing that vision. While social philosophy envisions an ideal community, schools, classrooms, curricula, teachers, and students are the means through which these ideals are put into practice. Education has the power to shape societies and to determine the path by which a given society realizes its social ideals. For this reason, one of the tasks of educational philosophy is to reflect upon the rela-

tive values and significance of the social ideals that undergird and guide a society's educational practices.

In the liberal democratic tradition, social philosophy and education assume a particular form. On the one hand, democracy requires common goals and consensus. On the other hand, it depends upon dissent and an open exchange of ideas. Education in democracies therefore finds itself faced with two potentially conflicting tasks: it must teach future citizens to live together in harmony, but it must at the same time teach them how to express opinions which are opposed to the common or majority view. Therefore, democratic education must both reproduce *and* renovate a given society, maintaining a set of collective goals while at the same time revitalizing and improving them (Euben 1997). While some educational theories have sought to address both of these social purposes simultaneously, most have emphasized one concern or the other. As Neil Postman (1979) suggests, there are two traditions of educational thought in the West: One views education as first and foremost a “conserving” activity; the other sees education as primarily “subversive.”

Both of these traditions have a long history. If, as Alfred North Whitehead famously quipped, “all philosophy is a footnote to Plato,” then it should not surprise us to find arguments in favor of each of these opposing educational aims in Platonic thought. The conserving vision of education can be represented by Plato's line of argument in *The Republic*. In this work, Plato (1992) argues that education should cultivate citizens who can sustain the social and political order. Education should support the needs of society and prepare future citizens to participate in it harmoniously. The “subversive” vision of education can be represented by Plato's character of Socrates (Postman 1979). Through the figure of Socrates, particularly in *Apology*, Plato (1961a) suggests that education should teach individuals to challenge the complacent values of society. For Socrates, and for the subversive tradition more generally, such opposition to current social norms is not opposition to society itself. On the contrary, such critical examination of present norms is undertaken in order to renew a society and make it more faithful to its own ideals.

Many thinkers have since traveled down one of these paths blazed by Plato. In what follows, each of these traditions of social philosophy of education will be considered in turn.

EDUCATION AS CONSERVING

The vision of education as conserving starts from the premise that society is basically good and that the purpose of education is to preserve and maintain its values and traditions. The aim of conserving education is the creation of good citizens. It emphasizes how to participate in a given society in productive ways, not how to challenge, disrupt, or transform the social order.

Education for a Harmonious Social Order

In the first place, the conserving tradition emphasizes the need for harmony in society. In *The Republic*, Plato (1992) asks what is required to create an ideal just state. He concludes that the best community is a harmonious one, and that this requires each person to perform the social role for which he is best suited. In order for this to occur, Plato argues, the state must educate citizens to fulfill their roles. For Plato, then, education is essential to realizing the ideal of just or harmonious society in which the integrity of the community is put before the free expression of the individual.

For Aristotle (348–322 B.C.E.), the question of whether education should conserve or critique social mores, promote harmony or individuality, was not a prescriptive one. Rather, Aristotle makes a descriptive point when he portrays education as a conserving activity. For Aristotle (1955), the most important thing to be learned is virtue or excellence of character, and the only way that this can be learned is by witnessing exemplary members of one's community as they enact the virtues. Education must be conserving, therefore, since the substance of education is the mores of one's society.

Education for Democratic Participation

The idea that education could prepare citizens to live together amicably is also the basis of the public schools movement in the United States. Access to universal public education is close to the heart of the American conception of democracy. For Thomas Jefferson (1743–1826), a participatory democracy required a literate citizenry, fully capable of understanding and debating the merits of a host of political issues as a prerequisite to casting informed votes.

Producing such a citizenry required a firm commitment to universal public education. Jefferson and other leaders in this movement, including Benjamin Rush (1745–1813) and Noah Webster (1758–1843), advocated a uniform and systematic form of education that would create a united citizenry with a common culture and commitment to common goals. Homogenization of a diverse population was necessary in a new country without a history or culture to bind it together. Education would also prepare future leaders in a new land led not by monarchs but, rather, by free men. Thus, Jefferson outlined a plan for public schools open to all (though this did not at the time include women, slaves, or other disenfranchised people).

Horace Mann (1796–1859) continued the American public schools movement and advocated what he called the “common schools” (Mann 1957). In particular, he responded to the vast waves of immigration in the United States and the need for an education that gave people a common basis. Mann argued that education was necessary in order to unite the populace and argued that education should be the “great equalizer” in the United States.

In the twentieth century, John Dewey (1859–1952) was the most influential thinker to discuss the interrelationship of democracy and education. For Dewey, as for all of the thinkers in this tradition, education exists to sustain communities. He wrote, “The primary ineluctable facts of the birth and death of each one of the constituent members in a social group determine the necessity of education . . . Beings who are born not only unaware of, but quite indifferent to, the aims and habits of the social group have to be rendered cognizant of them and actively interested” (Dewey 1916, 3). Through education, older generations pass on to the younger generations their ways of life. Without education, there would be no continuity from generation to generation, and society could not sustain itself.

Dewey was particularly interested in how specifically democratic societies reproduce themselves through education. According to Dewey, democracy includes not only what we consider to be democratic activities such as voting, but also, and more significantly, a mode of interacting based on equality and exchange of ideas. For Dewey, then, democracy was more than a political system; it was a form of life. To live democratically is to take into account the inter-

ests of all of a society's members, and democratic education must teach people to live together in such a way. Education, for Dewey, was not only a preparation for democracy as it was for Jefferson and the public school movement. Rather, the school itself became a microcosm of the greater society in which young citizens practiced living together in a democratic fashion.

More recently, political theorists such as Amy Gutmann (1987) and Benjamin Barber (1992) have argued that education must teach democratic values so that people from diverse backgrounds can share in a common civic culture. This entails teaching them about the history of American democracy with the intention of creating a sense of commonality. Although such contemporary philosophers also emphasize the importance of dissent in democratic societies, they insist that the purpose of such disagreement is to create a cohesive society in which people come together to work toward common goals and sustain community life.

Education as Cultural Inheritance

A number of philosophers of education have argued that education is responsible not only for passing on political traditions, but cultural ones as well. For a community to flourish, its culture must be carried on, and this requires education. Notable thinkers within this tradition include Matthew Arnold (1822–1888), Robert Maynard Hutchins (1899–1997), and Michael Oakeshott (1901–1990). These philosophers described the school as a reflective space in which students can be introduced to their culture and to the values embedded in its artifacts (Arnold 1994; Hutchins 1999). Such learning takes place in school because life outside of the classroom is often too busy and too driven by utilitarian priorities for careful study of forms like drama, poetry, music, and art (Oakeshott 2001).

More recently, E. D. Hirsch (1988) has made a related argument in favor of “cultural literacy.” Rather than focusing on the passing down of the canon, though, Hirsch emphasizes the transmission of common cultural terms and references. In Hirsch's view, all students need such cultural literacy to succeed in society. This shared base of knowledge allows us to communicate across our differences and forge a more cohesive national identity. In a society characterized by the mixing and melting of cultures,

however, the question of what should count as “cultural literacy” is a fractious one. Multicultural critics are apt to point out that any list of cultural references will inevitably reflect the bias of particular subcultures. To declare such a list “common knowledge,” they fear, is to perpetuate the marginalization of subcultures whose ideas, figures, and terms have yet to gain wide currency.

EDUCATION AS SUBVERSIVE

Whereas the vision of education as conserving trusts that society is good and can be preserved as such through education, the vision of education as subversive begins with the idea that society is flawed, characterized by such vices as thoughtlessness, conformity, injustice, and greed. Education therefore becomes a means of challenging society's vices in order to create a more just social order and to free individuals from oppressive social structures. In this view, education works *against* society, but for its own good.

Education as the Cultivation of Dissent

Let us return briefly to the work of Plato, which can be seen as inaugurating the subversive tradition as well as the conserving one. In the Platonic dialogues, Socrates is presented as a gadfly who taught others to scrutinize their accepted beliefs. Socrates' particular approach was to engage an interlocutor in a dialogue about everyday matters and to question the assumptions that arose. When one of his interlocutors claimed to know something, Socrates would inquire further, through a process known as *elenchus*, until the interlocutor realized that the assumption was based on partial, incorrect, or faulty thinking. This challenging approach caused discomfort in his fellow citizens, ultimately leading to Socrates' imprisonment and his famous trial. In his defense he argued that it was for his society's own good that he questioned and taught others to do the same. If a democracy is to have deliberation and discourse, then its citizens must be trained to think. Socrates' judges were not convinced and called for his death. This verdict can be understood as a tragic instance of a failed democracy that did not value its greatest educator. Plato's depiction of Socrates' life and death suggests that education in a democracy should struggle against the tendency of communities to lapse

into conformity of thought. A healthy democracy should value its subversive elements.

A contemporary educational movement with its roots in this Socratic ideal of dialogue and dissent is commonly referred to as *critical thinking*. (See next entry for a discussion of critical thinking as an approach to learning.) The critical thinking movement values intellectual autonomy, aiming to teach students to think carefully, logically, and dialectically as Socrates did. This is an essential part of civic education in a democracy, which requires that all people are capable of deliberation. It is also considered important for identifying media bias, resisting the power of commercial advertisements, social prejudices, and, more generally, judging the validity of others' claims and reasoning. (Paul 1995).

Education and the Dangers of Socialization

In the modern era, thinkers such as Michel de Montaigne (1533–1592), Jean-Jacques Rousseau (1712–1778), Ralph Waldo Emerson (1803–1882), and Friedrich Nietzsche (1844–1900) developed the subversive tradition in new ways. For these thinkers, society's tendency toward mindless conformity required more than the examination of arguments and the cultivation of dissent. What was called for was the cultivation of genuine individuals, people capable of figuring out who they are, what they need, and what they value. Such thinkers offered ideals of self-examination, self-reliance, and authenticity as antidotes to conformity and slavishness (Montaigne 1993; Emerson 2003; Nietzsche 1990).

According to Rousseau, education should follow the natural development of the young and shield them from the corrupting influences of society. In *Emile: or On Education*, Rousseau (1979) argues that people are naturally good but that society severs individuals from their natural impulses, thereby denying them their full humanity. For Rousseau, true education is filled with the "lessons" of nature, not those of books; it is motivated by necessity, not the authority of the teacher. Like Socrates before him, Rousseau understood education as a subversive force, working for the long-term health of society by opposing its present forms and tendencies.

There have been several attempts to put Rousseau's philosophies of education into practice in schools. Most famous is the Summerhill School in England

founded by A.S. Neill (1883–1973). Neill (1992) designed the school to be a haven away from society in which students could develop naturally, without coercion, at their own pace, and according to their own interests. Students at Neill's school were allowed to choose whether to attend classes, and the students had control of the governance of the school. The "deschooling" movement of the 1960s and 1970s led by Ivan Illich (1926–2002) was inspired by this same ideal (Illich 1971). These experiments in radical education endeavored to realize a social order in which people would not conform to the external authority of the state or society.

Education for Social Justice

Another strand of contemporary thought in the subversive tradition has focused less on the problems of conformity and more on deep structures of social inequality such as class, race, and gender. Here the question of how to educate the citizenry becomes more difficult because Western societies are not only democratic, but also capitalist. Following the work of Karl Marx (1818–1883), who considered the ways in which the capitalist system both produced and perpetuated economic inequality, this has meant a focus on the way in which schools as social institutions contribute to the uneven distribution of wealth across the population. Over time these theories have become increasingly nuanced, as other differences that can serve as the basis for social inequality—race and gender, to name the most prominent among them—have been included for consideration.

For such critical theorists, education is both current cause and potential remedy for various types of oppression and inequality. This line of inquiry has looked directly at practices within schools that reinforce existing hierarchies (for example, by studying ability tracking and its correlation to student socioeconomic level, or by examining how testing practices presume knowledge more available to some social groups than others). Or it may focus on the way in which certain kinds of abilities and skills become dignified with the label of knowledge to the exclusion of others. Influenced by Marxian thinkers such as Antonio Gramsci (1891–1937), Louis Althusser (1918–1990), and by the singular work of Michel Foucault (1926–1984), philosophers of education have come to see knowledge itself as an effect

of power relations in the larger society. What sorts of things come to count as knowledge, and what sorts of methods and approaches are accepted as leading to that knowledge have both come to seem as much a matter of politics and power as a matter of pure epistemology.

A notable example of the critical theoretical approach can be found in the work of Paulo Freire (1921–1997). Dismayed by the social, economic, and political inequities he saw in peasant communities in Brazil, Freire (1970) created a method he called “pedagogy of the oppressed.” In his view, traditional education provided a curriculum almost entirely disconnected from the realities of the students and thereby played its part in leading students to misunderstand and misrecognize the true nature of society and the injustice of its arrangements. In place of this, he advocated a method in which students would confront—or “name”—their reality. The goal of such education is to pose current reality as a set of problems, thereby helping students understand the obstacles to social justice and to create and implement solutions.

In the last few decades, Michael Apple (1990), Stanley Aronowitz (Aronowitz and Giroux 1985), Henry Giroux, and Peter McLaren (1986) have been notable proponents of the view that schools are ideologically motivated institutions that can function to oppress and marginalize certain people in society. They assert that education today plays its part in producing and maintaining an unequal social and economic order, promoting values antithetical to a truly democratic and multicultural society.

This line of critique has been complicated and enriched by thinkers such as Valerie Walkerdine (1981), Jane Roland Martin (1985), Elizabeth Ellsworth (1989), bell hooks (1994), and Lisa Delpit (1995), who draw from feminism, multiculturalism (with its roots in post-colonial and critical race theory), and queer theory in order to provide an ever more finely tuned view of how social differences play out in a variety of educational settings. In all of this work there is an interest in understanding how relationships of domination and subordination play out in traditional education, and in devising approaches that will alter and ameliorate those relations. At the heart of this approach is a passion for social justice and the belief that educational practices should work to create a more just society.

Finally, the work of Maxine Greene is a prominent and powerful voice in the contemporary discourse on philosophy and politics. Like Freire, Greene suggests that naming obstacles and striving for new possibilities is essential to realizing our potential as human beings (Greene 1995). In particular, Greene suggests that art is an important means to liberatory education. She asserts the importance of aesthetic experience in education as part of an effort to create an ideal political and social climate.

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CONCEPTIONS OF LEARNING AND THEORIES OF KNOWLEDGE

Whenever we successfully educate, our students learn. This is the case whether the learning is self-directed or imposed, internally or externally motivated, the result of rote memorization or constructive inquiry. It holds true across all academic disciplines: the words “student” and “learner” are virtually interchangeable. Therefore, a philosophy of education must include an account of the nature and purposes of learning. In order to provide such an account, one must consider questions such as: What is knowledge? What can be known? How do we come to know? What is truth? What counts as reliable evidence? What is the difference between knowledge and understanding? What knowledge is of most worth? The branch of philosophy that deals with these questions is epistemology. What follows is a survey of several important conceptions of learning with attention to the epistemological issues raised by each.

LEARNING AS ACQUISITION OF KNOWLEDGE

According to the most familiar model, to learn is to gain knowledge—but what is knowledge? Classically, knowledge has been defined as justified true belief. That is, we know something when (1) we believe it, (2) our belief is true, and (3) our reasons for believing are sound. We can, of course, learn things that are not knowledge. We can hold false or unjustified

beliefs. But such learning is not generally considered to be among the aims of education. We would prefer our students to possess something more like justified true belief. Justification, truth, and belief are all important topics within epistemology.

Of these, truth has been the object of the greatest attention and debate. The mathematician and logician Alfred Tarski (1944) famously defined truth as follows: The statement "Snow is white" is true if and only if snow is white. In other words, a proposition is true in so far as it corresponds to an external, objective reality. This view and others like it are called correspondence theories of truth. Correspondence theories are also foundational; they presuppose that we can know certain truths about the world, and build upon this knowledge to determine other truths. Certain beliefs, in other words, are trivially or self-evidently true (foundational), and more complex beliefs are built on them. René Descartes (1596–1650) proposed his famous axiom, "I think, therefore I am," as one such foundational belief (Descartes 1997). Israel Scheffler (1965, 4–5) distinguishes two kinds of foundational views: the rationalist, which deduces claims from axioms, and the empiricist, which builds on our experience of the natural world.

For most of the history of philosophy, foundational theories of truth were the only ones given serious consideration. However, such theories are prone to problems of regression. If complex beliefs rest upon simpler, more evident beliefs, what do these beliefs rest on? How do we know that our most basic beliefs (sense data, for instance) actually correspond to reality? To what foundational beliefs may we appeal to guarantee that the whiteness of snow is not a mere appearance, but actually a feature of reality?

John Dewey (1859–1952) rejected foundationalist understandings of truth. According to Dewey's (1963, 36–55) pragmatic epistemology, an idea is true when it is successfully used in action to solve problems and in inquiry to advance a conversation. The truth of any idea is a function of its usability. Under such a conception, no truth is ultimate or unchangeable.

Other theories of truth avoid foundationalism differently. Coherentism, for instance, maintains that large-scale, logically consistent belief systems are true, and that individual beliefs are true in so far as they "fit" into such systems. Many pragmatists and postmodernists, rejecting classical ideas of truth, hold something like a coherentist view. But this too has

its problems. It is possible to build a logically consistent set of beliefs that bears no relation to the actual state of things in the world. Some conspiracy theorists hold such a set of beliefs, and we are reluctant to call them "true."

It is evident that our brief discussion of truth has already moved us into the area of justification. If I believe something on a hunch or a whim, I cannot be said to "know" it, or (in any rich sense) to have learned it. Superstition is not knowledge. Another set of questions in epistemology, then, revolves around what sorts of processes can reliably justify a belief.

One way to elide these questions is to engage in radical skepticism about all forms of truth, to state that "there is no such thing as Truth," that what passes for truth is merely socially constructed belief, semantics, or power relations. One prominent epistemologist, Alvin Goldman (1999, 7–40) has catalogued no fewer than six different forms of this "veriphobia." As the contemporary philosopher Bernard Williams (2002) has pointed out, this way of thinking is both dangerous and wrong. It is dangerous because it subverts academic virtues such as truthfulness. How can we ask students to be truthful if truth is an illusion? It also cheapens the humanities, where such denials are more commonplace than the sciences. If history and literature have no truth to offer, why study them? But, equally if not more importantly, the "truth deniers" are inconsistent; they use hidden truths to leverage their own denials. For example, persons who claim that truth is a mask for power relations are stating a belief and if pressed will offer justifications.

When we conceive of learning as the acquisition of knowledge, we are forced to take a stand on these thorny questions about the nature of knowledge, truth, and justification. Different epistemological assumptions lead to different conceptions of the student and the act of learning. For example, a rationalist epistemology makes it most important for the student to learn axiomatic truths, and is most at home in the teaching of mathematics. An empiricist model, by contrast, will focus on crafting experiences that will help the student learn more about the world.

LEARNING AS DEVELOPMENT OF SKILLS

All of the forms of knowledge so far discussed have been propositional. That is, the knowledge they rep-

resent can be stated as a set of propositions, or declarative sentences. Such sentences can be true or false, justified or unjustified, believed or doubted. But propositions are not the only things we talk about when we talk about learning and knowing. A student can also learn to read, ride a bicycle, or bake bread. None of these forms of knowledge fit neatly into the propositional paradigm. Language acquisition has famously eluded it. With what propositional beliefs are children armed as they start to learn their native tongues? The question seems unanswerable. Languages, like so many other things we learn, are skills, abilities, or capacities, and a skill cannot be reduced to a set of beliefs. In speaking of skills, we are likely to use the phrase “knowing how” as opposed to “knowing that” (Ryle 1949, 25–61).

To explain how we gain such understanding or “knowing how” requires something other than classical epistemology and the knowledge-acquisition model. Several important alternate paradigms, each attached in some way to a theory of learning, have been proposed.

Behaviorist theories see the student as responding to environmental stimuli by exhibiting observable behaviors, and concern themselves with how best to elicit such behaviors. The student is envisioned largely instrumentally and mechanically, as a relatively passive respondent in a teacher-mediated environment. The method is that of objective science. Cognitive theories focus on the process of development in the learner and see knowledge as always in flux. They concern themselves with each student’s readiness to learn new concepts, charting stages of development according to the child’s cognitive capacity. One such theory, Jean Piaget’s (1971) *Genetic Epistemology*, sees knowledge itself as developing like a person, within historical time. Social learning theories maintain that all complex human learning takes place in a social framework, and that it is a mistake to see the learning process solely as something going on in one individual learner. Instead, such theories prioritize the interaction between student and teacher (Vygotsky 1978, 79–91) or between student and environment (Bandura 1977).

Behaviorist and cognitive theories of learning tend to envision skills as small units of practices. Practical know-how is seen as a technical ability, learned by breaking down and mastering these smaller skills, applying rules to them, and learning how the rules fit

together. Thus a basketball player, for example, knows how to dribble, to pass, and to shoot, and when to do these things in the context of a game. Under this paradigm, higher-level work, like medicine, would be mastered by learning basic science and applying it to the practice. Donald Schön (1930–1997) calls this epistemology of practice “technical rationality.” He claims it is the dominant educational model, but of little use in helping practitioners solve complex problems in the field. Instead, he proposes “reflection in action.” Under this paradigm, people learn by doing, together, and teach themselves by reflecting on their own responses to moments of vulnerability, surprise, or lack of control (Schön 1987).

LEARNING AS PERSONAL TRANSFORMATION

Some philosophers of education conceive of learning as a profound process of change. Philip Jackson (1986), for example, distinguishes between what he calls mimetic and transformational teaching. The mimetic model views teaching as the transmission of knowledge and skills. It understands learning as the addition of discrete pieces of information to an existing framework. The transformational model sees the teacher as someone who provokes and guides a qualitative change in the consciousness of the student. It conceives of learning as an ethical change, in which students acquire new terms with which to understand their lives.

The mimetic model is more likely to be endorsed in a pluralistic society where the schools are expected to remain neutral on questions of the good life. The idea that education is simply the transmission of information seems to satisfy this condition of neutrality. In contrast, the notion that education involves a transformation of the whole person is likely to seem anti-democratic. Whether mimetic learning is truly neutral on the question of how one should live is not at all clear, but transformative educators certainly cannot avoid this question. Transformational learning may even strike some as a form of indoctrination, violating the autonomy of students.

In most transformational theories, though, the student is seen as a willing partner who takes responsibility for his own learning. Furthermore, where indoctrination suggests conversion to a common mindset, transformational theories typically view the “knowledge” learned (or constructed) as a set of

deeply held personal insights and moral meanings, which necessarily differ from one student to the next.

Consider the example of liberal education, our most enduring tradition of transformational learning. For Michael Oakeshott (1901–1990), the leading modern theorist of this tradition, liberal learning is a conversational quest for self-understanding. A human being, Oakeshott (2001) claims, is constituted by his thoughts, sentiments, purposes, and meaningful expressions or actions—and humans must learn these things. Thus, liberal education is not so much a transformation of a person as a transformation into the full possibilities and responsibilities of personhood. In this tradition, learning is an essential feature of our humanity.

Indeed, far from indoctrination, many transformational theories view education precisely as liberation. Again, the tradition of liberal learning can serve as an example. As Robert Maynard Hutchins (1899–1977), former president of the University of Chicago and leading modern representative of this tradition, puts it: “Liberal education is for everybody, because everybody has a right to have his mind set free” (1969, 112). There is also a family of liberatory theories, which view education as a transformation freeing students from the effects of political inequality and social oppression. This conception is discussed in greater detail in the next entry.

NORMATIVE DIMENSIONS OF LEARNING

Whether we view learning as knowledge-acquisition, skill development, or personal transformation, one question inevitably arises: What is most worth learning? In other words, educational epistemology has a normative dimension. In addition to asking what knowledge is and how we come to know, we must also ask the question made famous by Herbert Spencer (1820–1903): “What knowledge is of most worth?” (Spencer 1963)

In the knowledge-acquisition model, the answer to this question seems to be: that which we have the most reason to believe. In other words, the ideal is to scrutinize all beliefs for their truth and justifiability. Once something is established as knowledge, it is clearly worth being taught. The trick is that all justifications are fallible and all epistemic conclusions reversible. In this tradition, then, what is normative

is not a set of conclusions, but an attitude toward reasoning itself. Thus, many philosophers of education have explored the nature of “critical thinking,” or thinking that shows due care and attention to “the probative force of the relevant reasons” (Bailin and Siegel 2003, 182).

Relocating the normative question from “What knowledge?” to “What approach to knowing?” still leaves ample room for controversy. While some theorists have sought to identify universal features of good thinking, thinking most likely to lead to knowledge, other scholars have pointed out the multiplicity of ways of thinking and types of intelligence. Psychologist Howard Gardner (1993, 12) refers to his multiple intelligences as “ways of knowing the world,” and suggests that schools must take all of these ways into consideration when designing curriculum and pedagogy. Mary Belenky (1997) and her colleagues have argued that some of what we have taken to be universal strategies of knowing are in fact masculine ones, and that there exist in contrast distinctive “women’s ways of knowing.”

In the skill-development model, the key normative question is “Into what practices is it best to be initiated?” As R. S. Peters (1967, 22) remarks, “arguments must be given for initiating children into activities and forms of awareness such as science and poetry rather than bingo and horror films.” One philosopher who has answered this call is Alasdair MacIntyre. MacIntyre’s (1981) theory of ethical practices emphasizes the plurality of worthwhile activities while still providing a way of understanding the greater value of arts like painting and poetry, disciplines like history and philosophy, and other longstanding practices like fishing and governing. Any attempt to rank some cultural activities above others, however, is bound to be hotly contested. Multicultural critics point out that hierarchies between activities inevitably reflect cultural biases and a history in which certain cultures have been privileged over others. Others take issue with the very notion that any symbolic activity is in itself richer or poorer, arguing that we ought to focus instead on what participants do within their chosen spheres. Paul Willis (1994), for one, argues that young people may exercise more “symbolic creativity” with the resources of magazines and comic books than adults do at the museum or opera house.

One might expect that learning as transformation is

the one model that safely avoids such normative epistemological questions. Talk of self-understanding and meaning making may strike us as entirely subjective, as if students in this model could project whatever meanings they wish upon an issue, text, or event. Many scholars working on this model, however, have sought to show how learning can vary across learners—given the personal investments and idiosyncratic histories of learners—without therefore becoming arbitrary. Wolfgang Iser (1978), for example, explores how literary texts structure the experience of readers even as it is the imagination of the reader that brings the text to life. Similarly, Elizabeth Ellsworth (1997) explores how learning involves being positioned by a teacher's, classroom's, or text's "mode of address," that is, its set of assumptions about who the learner is. This is also a central problematic in philosophical hermeneutics, the study of interpretation, understanding, and their place in human life. Hans-Georg Gadamer (1900–2002), the key figure in this area, argues that all understanding requires interpretation and that all interpretation requires application of a text or idea to the new and particular situation of the interpreting subject. At the same time, Gadamer (1993) takes great pains to show how impersonal forces such as history, language, and the structure of play enable and constrain the process of interpretation.

In the end, however, ethical questions are unavoidable in this conception of learning as in the others. Here the question is not about the quality of reasoning or the relative worth of practices, but concerns the kind of person it is excellent to become (via the transformation of learning) and the richness and intelligibility of our life narratives (via our efforts at liberal learning and other varieties of meaning making).

One relatively new way of working with the normative dimensions of learning is through virtue epistemology. According to virtue epistemologists, human beings are capable of possessing intellectual "good habits," qualities such as perseverance, open-mindedness, judgment, and the like (Zagzebski 1996). Many such theorists claim that intellectual virtues serve as normative tests for justification: evidence for a belief is reliable when it is arrived at through the operation of these traits. A belief becomes more authoritative when it is expressed by a person who has come to believe it through intellectually virtuous means, and who expresses it within that context. Under such a conception the student must, to achieve knowledge,

learn these habitually virtuous ways of knowing. Thus, for virtue epistemologists, all education is in some sense moral education.

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THE TEACHER AND THE ACT OF TEACHING

What is teaching and what does it mean to be a teacher? How should we understand the nature of the teacher-student relationship? Such questions have long occupied philosophers of education bent on understanding the complex human interactions at the heart of the educational enterprise.

In recent years, there has been a good deal of controversy over the preparation of teachers. Some contend that teachers need more expertise in their subject matters; others suggest that teachers need more expertise in instructional methods. Both sides in this debate seem to agree, however, on a common conception of the teacher as a professional defined by a kind of expert knowledge. This idea is not as uncontroversial as it may seem. It is based on a particular model of professional practice—the technical, applied-science model—and it assumes that learning involves transmission of knowledge rather than the transformation of persons. For more on these two conceptions of learning, see the previous entry. Though it has come to seem like common sense, the notion of the teacher as expert has a determinate history (Welker 1992) and philosophers of education, past and present, have explored many alternative conceptions.

For example, the teacher has been envisioned as a turner of souls (Plato 1992; Haroutunian-Gordon 1991), a liberator (Nietzsche 1990), a revolutionary (Counts 1978), and a stranger (Greene 1973). Teaching has been described as: a calling (Hansen 1995); a moral craft (Tom 1984); and a quest for spiritual insight (Inchausti 1993), self-knowledge (Palmer 1998), and immortality (Blacker 1997). In this entry we will consider three broad conceptions, each with its own variations: teaching as learning, as facilitation, and as relation. Though different in key

respects, all three of these conceptions could be said to have their roots in the enigmatic figure of Socrates (c. 470–399 B.C.E.).

THE EXAMPLE OF SOCRATES

In the dialogues of Plato (c. 438–348 B.C.E.), we have our first and most enduring image of a teacher who is above all an exemplary learner. Indeed, Socrates denied that he was a teacher at all. To understand why he did this is to understand why, in fact, Socrates can be considered one of the greatest teachers of all time. Socrates defined himself against the professional teachers of his time. These teachers, known as “sophists,” supposedly possessed great knowledge, which they taught their students for a fee. Socrates believed this kind of teaching was dangerous, for it convinced people that it matters more to know or even to appear to know than it matters to seek after wisdom. Of primary importance to Socrates was self-examination, for as he famously put it: “the unexamined life is not worth living.” (Plato 1961a) Socrates undertook his self-examination in public, drawing others into dialogue about matters of fundamental concern. Socratic dialogues tend to move not from questions to answers, but from answers—or as it turns out, assumptions—to questions. Socrates did not teach others by sharing wisdom, but by modeling what it is like to be a perpetual student in the quest for wisdom.

Socrates also serves as the archetype of another conception of teaching. In Plato’s (1961b) *Theaetetus*, Socrates refers to himself as a midwife. In other words, through his relentless questioning, Socrates helped his interlocutors give birth to their own ideas. This suggests a vision of the teacher not as someone who imparts knowledge or even as someone who models various intellectual virtues, but as a facilitator: someone who is a catalyst and guide of students’ own processes of learning and transformation. Facilitation does not necessarily indicate a passive stance. Socrates’ midwifery, for example, involved a strenuous attempt to bring his interlocutors to the insight that they did not truly know what they thought they knew. Without this insight, Socrates contended, we lack the genuine desire to learn which makes learning possible.

If we look more closely at the process by which Socrates guided his interlocutors to this insight we

see the roots of yet a third conception of teaching. To help his interlocutors acknowledge their ignorance, Socrates does more than question assumptions and provide counter-arguments. Socrates quotes poetry and myth, conducts thought experiments and live demonstrations, and makes use of self-deprecating irony, biting sarcasm, and gentle humor. When one looks closely at this diverse and shifting set of diverse pedagogical moves, it seems misguided to speak of a Socratic method, *per se*. Socrates’ actions do come into focus, though, when we view his teaching first and foremost as relational, as responsive to his interlocutors’ particular states of mind and the rhythm of their unfolding interaction. (Higgins 1995) As a teacher, Socrates displays not only logical acumen, but also great interpersonal sensitivity and emotional range. He knows when to be serious and when to be playful, when to be harsh and when to be gentle, when to bring an insight home and when to let learners have more distance from the topic at hand.

In sum, Plato presents us with a rich portrait of a singular teacher. In the fertile example of Socrates, we see teaching figured as learning, as facilitation, and as relation. Let us now consider the developments in each of these conceptions since the time of Socrates.

TEACHER AS LEARNER

Many philosophers of education have suggested that teaching is above all an act of learning. John Dewey (1916, 160), for example, suggests that education is a “shared activity” in which “the teacher is a learner, and the learner is, without knowing it, a teacher—and upon the whole, the less consciousness there is, on either side, of either giving or receiving instruction, the better.” According to this conception, to inspire others to learn requires that one be a learner oneself, demonstrating both the passion and methods of learning. The best teachers are exemplary learners.

This is the conception of the teacher that has animated the long tradition of liberal learning. In the scene of liberal education, the teacher is understood as one more learner joining the task of reading and interpreting a text, and discussing the issues it raises. As the lead learner, the teacher models how to approach the text, how to frame key issues, how to

raise and meet objections, and so on. Liberal learning concerns issues about which intelligent people can and should disagree, for example, What is culture? How does the present differ from the past? What is the place of thinking and of feeling in human conduct? Thus, it is not the liberal educator's job to instruct students what to believe on such questions. Rather, the teacher in liberal education models how to believe and to doubt, how to distinguish and to synthesize, and how to do all of these things intelligently. In demonstrating his or her own critical, imaginative, and passionate engagement with texts, the liberal educator shows students how to enter and profit from the ongoing conversation that is culture.

More recently, this idea that students must develop their own understanding of the material has come to be known as constructivism, and our sense of the material to be understood has shifted. Many now eschew the "great books" of liberal learning, asking students to inquire instead into nature or social relations. Nonetheless, the notion of the teacher as learner still applies. If learning is a process of inquiry, rather than the transmission of a set of inert facts, the teacher must be able to demonstrate for the student what it means to inquire. Paulo Freire (1970), for example, criticizes what he calls the "banking concept" of education in which teachers are seen as depositors of knowledge in the minds of students. He contends that the teacher-student relationship should be thought of as a joint, dialogical inquiry in which the teacher also learns and the students also teach. In one variation on this idea, the teacher is thought to be a co-inquirer into the subject matter. In another, the teacher is seen as a student of education itself, studying what her students need and how they learn. In yet a third variation, the teacher is viewed as a public intellectual, someone who views the classroom as a prime location to learn about social reproduction and transformation and to participate in social change (Giroux 1988).

In an important new line of research (Dunne and Hogan, *in press*), teaching is seen as an ethical practice in the sense given to that term by Alasdair MacIntyre (1981). According to this view, practices are not only sites of professional know-how, but ongoing inquiries into specific modes of human excellence. Practices give their practitioners a concrete context for the development and display of specific

virtues. To join a practice is to be situated as an apprentice to exemplary practitioners past and present, learning not only how to achieve excellence in the practice, but also how to join the conversation about what excellence means in this particular sphere and what that teaches us about human flourishing in general. To become a teacher, in this view, is to join a more-than-2,000-year-old conversation about the ends and means of human development. And it is to inherit specific resources for shaping a good life, a teacher's life.

TEACHER AS FACILITATOR

According to the facilitative tradition, the hardest thing to achieve as a teacher is neither that of being an expert knower nor that of being an exemplary learner. It is to step back and keep the focus on the students. As Robert Boostrom (1997) points out, it is not always easy for teachers to give up on their position as expert. According to the philosopher Martin Heidegger (1889–1976), it is the rare teacher who accomplishes that most difficult feat: to let learn (1968). Of course, this does not mean inaction on the part of the teacher. In the facilitative tradition, the teacher is responsible for setting up an environment that is conducive to learning.

For Jean-Jacques Rousseau (1712–1778), the most significant figure in this tradition since Socrates, creating such an environment is primarily a matter of shielding the child from corrupting influences. Rousseau (1979) believed that children learned best from the promptings of their own internal development and from necessity. He sought to delay as long as possible the child's exposure to the received ideas of books and the ego-driven world of social hierarchies. To facilitate Emile's learning (the eponymous fictional pupil of his major work), he purifies his social world to one carefully controlled relationship with his tutor and a few scripted interactions with others. He also forces Emile to learn from the consequences of his actions, for example, letting Emile experience a cold night's sleep after breaking a window in his room.

John Dewey (1859–1952) is the next major figure in this tradition. Here he gives voice to its major premise: "The educator's part in the enterprise of education is to furnish the environment which stimulates responses and directs the learner's course"

(Dewey 1916, 180). Dewey urged teachers to create environments that were not only responsive to the current interests of the child, but also that enrich and guide those interests. In other words, the educational environment reflects both the psychological and the logical side of the subject matter. Teachers construct environments that enable students to discover the subject matter, to approach it from the perspective of their own unfolding interests. At the same time, the teacher makes use of the logical organization of the subject matter, the fruit of the community's past discoveries, now synthesized, to ensure that the student's explorations are fertile.

Thus, creating the right environment requires significant effort, including awareness of how the student views the world and a deep understanding of the subject matter. For Paulo Freire (1921–1997), these were one and the same thing. Freire (1970) argued that teaching required close anthropological study of the lived experience of one's students, so that one could represent this experience to the students as a problem demanding inquiry rather than an inevitable fate to be tolerated.

TEACHING AS RELATION

According to some philosophers of education, the prime catalyst in education is the manner in which a teacher responds to and relates with the student. (Bingham and Sidorkin 2004) Within this tradition, we can identify two different camps, each emphasizing a different facet of Socrates' relational example.

For some, the example of Socrates shows that teaching is primarily a dialogical relation. According to this view, one must understand and cooperate with one's partner in dialogue, but the goal of the dialogue is not to understand each other. In the conception of dialogue that runs from Socrates to Hans-Georg Gadamer (1990–2002), the flow of dialogue is not dictated by the needs of the other so much as

it is by the unfolding logic of the subject matter under discussion. Nicholas Burbules (1993) helpfully delineates four varieties of such educative dialogue. Dialogues, he notes, can be either competitive or inclusive in spirit. Meanwhile, each of these types of dialogue itself admits of two variations, depending on whether it is oriented toward a conclusion or is inherently open ended.

Other educational thinkers have wanted to emphasize the interpersonal and psychological aspects of dialogue, inspired by the interpersonal attentiveness of Socrates, if not always approving of some of his rough handling of his interlocutors. The major modern thinker in this area is Martin Buber (1955), who viewed education as a special kind of attunement with and responsiveness to the other. Drawing on Buber and the feminist moral theory of Carol Gilligan (1982), Nel Noddings (1984) has described teaching as a caring relation. For Noddings, the key to caring is engrossment in the other. This is a kind of attentiveness that requires one to displace one's own motivations and to see the other unclouded by abstractions.

Postmodern philosophers of education have sought to extend each of these lines of thought with a cautionary note. Drawing on the work of Emmanuel Levinas, Jacques Derrida, and others, they have pointed out how the idea of dialogue presumes a kind of reversibility of perspective that may in fact be impossible. Likewise, they worry that pursuing the kind of receptiveness advocated by Buber and Noddings may lead the teacher to presume that she knows who her students are and what they want. To avoid the violence of assimilating the other, with their difference from our preexisting categories, postmodern theorists urge us to emphasize the fundamental unknowability of the other, while at the same time avowing our duty to respond to the other in need.

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EDUCATIONAL POLICY AND REFORM

Public education plays a unique role in our society. Policymakers frequently call upon public schools to address a wide range of social and economic problems. A major federally commissioned report, *A Nation at Risk* (National Commission on Excellence in Education 1983), observed that “Our Nation’s schools . . . are routinely called on to provide solutions to personal, social, and political problems that the home and other institutions either will not or cannot resolve.” Numerous examples can be cited. The *National Defense Education Act* was passed in 1958 in response to the Soviet Union’s successful launching of its satellite, Sputnik. Efforts to desegregate schools during the civil rights era were seen as major steps toward creating a society of racial equality. Investment in mathematics and science was called for when business reports showed labor shortage in technical fields. Global competition in recent years has prompted policymakers to raise academic standards.

The tendency to rely on public education as solutions to the nation’s problems is facilitated by several features in our system of governance. First, the American public strongly believes in local control to formulate strategies addressing collective problems. School is seen as a key local institution that is governed by local electoral process. Consistent with this democratic creed, political leaders tend to recruit public schools to contribute to problem solving, particularly on issues that require changes in the long run.

Second, proposals on education policy can be initiated from any of the three levels of government. In the United States, the federal, state, and local governments have shared responsibilities over education and thus enjoyed certain degrees of policy freedom. Any one of these three levels of government in our decentralized educational system can enact policy changes in response to their priorities at any given time. The 14,000 local school boards and the fifty

state boards exercise a substantial degree of autonomy in shaping policies. For example, states took several decades to enact their own compulsory attendance legislation. States also differ in their curriculum standards. While a few states maintain creationism as part of their science curriculum, most states have focused on evolution.

Third, education is shaped by the broader pluralist system of policymaking, where organized interests and citizenry play a legitimate role. Competing interests enjoy multiple, informal access from agenda setting through the legislative and budgetary phase. Third-party influence, such as media, can further articulate community concerns. Not surprisingly, conflicts over educational issues arise frequently. Educational policies are formulated as efforts to mediate competing views and contending interests. An increasingly vocal taxpaying public pays attention to how schools dollars are spent, for example, when a substantial portion of families no longer has children in the public schools. Further, the aging population may consider public education in competition with transportation, public safety, community development, and health care for budgetary allocation. During the 1990s, business-organized lobbying groups were successful in pushing for higher academic standards and stronger accountability measures. In districts with a large percentage of failing public schools, new political coalitions have emerged to seek for alternative ways of delivering schooling services, including charter schools and contracts with private management firms (Hill et al. 2000).

Clearly, education is an important policy arena. Several policy features merit public attention. First, public education constitutes a large portion of the government’s budget. About one-third of state and local tax revenues are allocated to public schools. School districts across the nation hire 2.5 million teachers who provide instruction to more than 45

million students, or 89 percent of the nation's student population in both public and private sectors.

Second, education draws from the same fiscal pie that is available to all public policy domains. Public education has to compete with other priorities in the governmental agenda, including post-secondary education, health care reform, welfare restructuring, and correctional facilities. In many states, spending for correctional facilities and health care grew much faster than spending for K–12 education in recent years.

Third, educational policy involves debates that are deeply embedded in our value systems. Contending beliefs include equity issues for classes of disadvantaged citizens, political accountability that respects the tradition of local control, constitutional guarantees of individual liberty, commitment to efficiency in service provision, and maintenance of democratic representation. Governmental institutions and their leaders are expected to manage competing values and reconcile contending interests in a changing society.

Fourth, education is a shared governmental responsibility. All three levels make decisions that affect schools. For example, school revenues come from all three levels of government. While federal grants account for about 6–7 percent of school spending, state contribution has stayed close to 50 percent since the early 1990s. To be sure, different levels of the government set their funding priorities. While the federal government has been a leading promoter of equal educational opportunities since the 1960s (as discussed in a later entry within this chapter), states exercise their constitutional authority by defining the powers of the local school boards, setting curricular standards, approving teacher certification requirements, and regulating taxing and spending practices of districts.

Fifth, decisions made by governmental institutions at different levels have an impact in learning opportunities for all children. Schools and classrooms are nested in a complex, multilayered policy system (Barr and Dreeben 1983; Wong 2003). The U.S. Congress and the state legislatures define the purpose of educational policy, formulate programmatic actions to meet the goals, and allocate resources to eligible segments of the student population. In administering programs, educational agencies can create opportunities and impose constraints on curricular and instructional activities in the school building. In some

circumstances, federal and state programs provide supplemental resources to students who come from at-risk environments. In other cases, governmental regulations tend to encourage teachers to pull out groups of students from the regular classroom setting for remedial instruction. In short, there is a connection between governmental decisions and classroom practices.

Given the policy prominence of public education, this chapter will examine several issues: How does educational governance shape policy and reform? What are some of the key reform initiatives in recent years? How important is the policy to promote equal access and school funding equity? What are the major initiatives to improve accountability and turn around low performing districts and schools? And why is there a growing interest in using parental choice as a reform strategy? This chapter will highlight the research and policy implications in each of these issues.

Kenneth K. Wong

GOVERNANCE AND EDUCATIONAL POLICY

Educational policy is shaped by our federal system of government. Federalism creates a decentralized structure of educational governance. It facilitates a division of power and authority among the three levels of government, namely, federal, state, and local. This entry will discuss the changing federal involvement in education, the states' constitutional authority, and the tradition and practice of local control.

EVOLVING FEDERAL ROLE

Historically, the federal government did not play an active role in education. Framers of the U.S. Constitution relied on the principles of "dual federalism." Article I, Section 8 of the U.S. Constitution specifies the "enumerated powers" that Congress enjoys and the Tenth Amendment granted state autonomy in virtually all domestic affairs, including education. Sovereignty for the states was not dependent on the federal government but instead came from the state's

citizenry. Consistent with this view, in *The Federalist Papers*, which were first published during 1787 and 1788, James Madison suggested a line of demarcation between the federal government and the states (Hamilton, Madison, and Jay 1961). He wrote, “The federal and state governments are in fact but different agents and trustees for the people, constituted with different powers, and designed for different purposes.” (Federalist Papers, No. 46, p. 296). The dual structure was further maintained by local customs, practice, and belief. It came as no surprise that in his description of the American democracy in the mid-nineteenth century, Alexis de Tocqueville (2000) opened his seminal treatise by referring to the local government’s “rights of individuality.” Observing the state-local relations in the New England townships, de Tocqueville wrote, “Thus it is true that the tax is voted by the legislature, but it is the township that apportions and collects it; the existence of a school is imposed, but the township builds it, pays for it, and directs it.” (p. 63). The division of power within the federal system was so strong that it continued to preserve state control over its internal affairs, including the de jure segregation of schools, for many decades following the Civil War.

The federal government began to take a more active role in education following the Second World War. The Cold War competition saw the passage of the *National Defense Education Act of 1958* shortly after the Soviet Union’s satellite, Sputnik, successfully orbited the earth. At the same time, the 1954 landmark Supreme Court ruling on *Brown v. Board of Education* and the Congressional enactment of the 1964 *Civil Rights Act* sharpened the federal attention to the needs of disadvantaged students. Consequently, the federal government adopted a major antipoverty education program in 1965, Title I of the *Elementary and Secondary Education Act* (ESEA).

The ESEA, arguably the most important federal program in public schools in the last four decades, signaled the end of dual federalism and strengthened the notion of “marble cake” federalism where the national and subnational governments share responsibilities in the domestic arena. Prior to the 1965 law, there was political deadlock on the role of federal government in Congress. States outside the south were opposed to allocating federal funds to segregated school systems. Whereas some lawmakers refused to aid parochial schools, others wanted to

preserve local autonomy from federal regulations (Sundquist 1968).

The eventual passage of ESEA and other social programs marked the creation of a complex intergovernmental policy system that is unique in American history. To avoid centralization of administrative power at the national level, the Congress increased its intergovernmental grants to support state and local efforts to carry out federal policy objectives. During the presidency of Lyndon Johnson, single purpose (or categorical) programs, including Title I, increased from 160 to 380. By the end of the Jimmy Carter administration in 1980, there were approximately five hundred federally funded categorical programs. Particularly important was the redistributive focus of many of these categorical programs that were designed to promote racial desegregation, protect the educational rights of the handicapped, assist English language learners, and provide supplemental resources to children from at-risk backgrounds. Federal engagement in these issues remained highly visible despite partisan politics throughout the presidencies of Ronald Reagan, George H. Bush, and William Clinton.

As the Congress enacted the *No Child Left Behind Act of 2001*, President George W. Bush further expands federal involvement in educational accountability for all children. The federal law requires annual testing of students at the elementary grades in core subject areas, mandates the hiring of “highly qualified teachers” in classrooms by 2005/06, and grants state and local agencies substantial authority in taking “corrective actions” to turn around failing schools. Further, the law provides school choice to parents to remove their children from failing schools. Equally significant in terms of federal intervention is the legislative intent to close the achievement gaps among racial/ethnic subgroups as well as income subgroups. To support these efforts, the federal government increased its allocation by \$1.7 billion to a total of almost \$11 billion in the Title I program, in addition to over \$900 million for early reading initiatives.

STATE CONSTITUTIONAL AUTHORITY

While the federal role addresses redistributive issues, the state assumes constitutional and policy authority over much of the jurisdictional territory of public edu-

cation. Clearly, our constitutional framework enables each of the fifty states to maintain its own educational system. From a constitutional-legalistic view, localities are political subordinates of the state, and local powers can be granted only with the consent of the state legislature. Despite interstate variation in governing tradition and culture (Elazar 1972; Wirt 1977), local districts are seen as agencies of the state educational system. The states enjoy substantial control over compulsory attendance, accreditation, curriculum, graduation standards, and such housekeeping matters as calendar, records, and accounting procedures.

In practice, once their legal status has been established, local school boards enjoy substantial control over critical resources that can be used to sustain their existence. School districts can select their own political representatives, decide on fiscal policies, and choose the scope of their services. Local districts generally maintain discretion over district organization, guidance and counseling, pupil-teacher ratios, staff recruitment, and extracurricular activities. Nonetheless, on school funding and accountability issues, as later parts of this chapter show, the balance of power has shifted toward greater state control in recent years.

At the state level, the selection of the state school board, though far from uniform across the fifty states, is largely an appointive process. Sixty-two percent of the governors appoint the state school boards. This group of states includes Florida where its governor appoints a state board that oversees both public schools and colleges. In Georgia, the state board lost substantial power in part due to a 1996 legislation that shifted power from the board to the superintendent and in part due to gubernatorial decisions to replace nine of its current eleven members (see Jacobson 1997, 21). In Illinois, the governor gained new power to appoint a chair of the state board of which membership had been cut from seventeen to nine. Gubernatorial appointment may be based on different formal criteria. For example, New Jersey stipulates that three of the thirteen board members must be women. Illinois provides partisan and regional balance in its state board.

Besides the governor, other political institutions are also involved in the selection of school boards. The legislature and the governor in three states jointly appoint their boards. In South Carolina, while the governor appoints one member, the state legislature appoints the remaining seventeen members. In Mis-

issippi, the governor selects five members and the legislature the remaining four members. In Rhode Island, nine members are appointed by the governor and two by the legislature. Further, the state board in New York is solely appointed by the legislature. Further, three states (Indiana, New Mexico, and Ohio) use a combination of gubernatorial appointment and the elective process. For example, while ten of the eleven board members in Indiana are appointed by the governor, the chief of the board is elected. Indiana also takes into consideration partisan balance on the board and requires it consist of four educators. Only 20 percent of the states have an elected board. Of these ten states, four use a nonpartisan ballot and five rely on partisan election. In Alabama, which has a partisan-elected board, the governor serves as the board president. In Washington, the members of the state board are elected by local school board members. Interestingly, Wisconsin and Minnesota no longer have a state school board.

The scope of the state board has gradually broadened. Six states grant the state board an authority that includes post-secondary education. These include Florida, Idaho, Missouri, Oregon, New York, and Pennsylvania. In Florida, Governor Jeb Bush appoints a "K-20" board that is designed to improve policy coherence at all levels of education. In New York, the board oversees public schools, higher education, cultural institutions, and licensed professions.

While most governors appoint their state school board, the state board selects most chief state school officers. As of January 2002, the board appoints its school chief in twenty states while the governor appoints the top executive in only ten states. Fourteen states elect their school chiefs. While eight hold partisan election, six use nonpartisan ballot to select their top school officer. Consistent with its populist tradition, the western region seems more likely to have a popularly elected chief school officer. Of the fourteen states that elect the school chief, seven are located in the western region.

In considering the selection methods for both the board and the school chief, several systems of governance seem to emerge. There is no state that maintains a popularly elected school governance system, namely an elected board and an elected chief officer. The closest example is Washington, where the school chief is popularly elected but the board is elected by the local school board members. In contrast, the most

common method of selection, practiced in twenty-four states, is an appointive system of both the board and the school chief. The remaining states tend to use a combination of selection methods. Twelve states have an appointed board but a popularly elected school chief. Nine states have an elected board but an appointed state school officer.

LOCAL CONTROL

Historically, states moved toward district consolidation to provide more uniform educational services in a more economical manner. Smaller districts often experienced difficulties in recruiting qualified teachers, upgrading physical facilities, and maintaining an enriched curriculum. There are about 14,000 independent school districts governing over 90,000 schools across the nation. In the 1940s, there were almost 109,000 school districts. School district consolidation occurred at a much faster pace than that of the local governments overall. While school boards constituted 70 percent of all local governmental bodies in 1942, they accounted for about 15 percent in 2002. Although four out of five school districts are responsible for fewer than 3,000 students, the average size of districts has grown over the years. Today, about a third of the districts are located in five states: California, Texas, Illinois, Nebraska, and New York.

While the number of school districts has changed significantly over the years, district governance and administration have remained remarkably stable. The dominant mode for the selection of school board members is a nonpartisan election held in an off year from the local general election. Board members can be elected from subdistricts or district wide (at-large). Term limits are not usually placed on board membership. These elections are rarely contested and usually involve very low voter turnout. Even fewer voters are likely to attend board meetings, which are often held on a monthly basis. Given the low political interest in school board politics, many researchers note the dominance of civic elites and interest groups in these elections. However, a few exceptions are found in major cities. Although an overwhelming majority of school boards are popularly elected, those in Baltimore, Boston, Chicago, Cleveland, New York, Oakland, Philadelphia, Trenton, and several other cities are appointed either by the mayor or jointly by the mayor and the governor.

The existence of independent school boards is supported by several factors. First, the school board as an autonomous institution is embedded in strongly held public beliefs in democratic, nonpartisan control over public education. The public has traditionally equated local control with district wide board authority in the constitutional-legal framework of educational governance. In contrasting private and public schools, Chubb and Moe (1990) characterized public-school governance as "direct democratic control."

From an economic perspective, the presence of multiple school systems resembles a quasi-market arrangement that can be cost efficient to the consumers. States and localities with multiple suppliers of services promise a better fit between consumer-taxpayers' preferences and the level and quality of local services. As Tiebout's (1956) classic work suggested, taxpayers make residential decisions that would maximize the benefits they expect to obtain from public services and minimize the level of taxes that they have to pay for those services. In particular, middle-class taxpayers who can afford to spend more on goods and services are keenly concerned about the quality of basic services, such as schools. As Hirschman (1971) argued, they are more ready to exit when they perceive a decline in those municipal services that they value. Studies of district-level performance in metropolitan areas suggest that inter-district competition can improve service quality (Hoxby 1998). The out migration of middle-class families to suburban school districts seems to provide the empirical support for this line of argument. Recent establishment of quasi-public boards that oversee charter schools also shows the increasing popularity of parental choice when the neighborhood schools are failing (Hill 1997).

Managerial consideration constitutes a third reason for local control. Thomas Shannon (1992), former executive director of the National School Boards Association, has argued that school boards serve several indispensable functions for the common good. They develop strategic plans, adopt an annual budget, manage the operation of the system, comply with federal and state laws, evaluate educational programs, arbitrate complaints from citizens and employees, and represent the collective interests of the entire district. The boards also negotiate contracts with teachers' unions and serve as managerial buffers between individual schools and state and federal agencies.

Within a local district, the daily operation relies heavily on a functional school bureaucracy, often referred to as the central office. The growth of a district-level bureaucracy throughout much of this century has contributed to a strong professional management model particularly in the urban districts. At the top of the central bureaucracy is the school superintendent, who assumes educational, managerial, and fiscal responsibilities of the entire district. To provide daily services to a large number of students, the school system tends to adopt a bureaucratic structure—centralization of decisionmaking, routinization of task performance, and standardization of resource generation and allocation (Bidwell 1965). The urban district resembles a complex hierarchical structure with centralized authority. The organization's insiders enjoy autonomy from outsiders' influence because the former possesses expertise and information on how the system operates. External pressures from state and federal government are largely accommodated through an internal division of labor, which is characterized by specialized bureaus where program administrators are insulated from one another. When allocating resources, the lay school board largely follows the suggestions made by professional administrators. Educational decisionmaking, in short, is largely embedded in the organizational milieu of the district (Tyack 1974; Cuban 1990; Callahan 1962; Danzberger, Kirst, and Usdan 1992).

To be sure, the urban context poses a particular challenge to educational governance as the public increases their demands for better student performance in recent years. Environmental constraints on urban schools are readily discernible in socioeconomic trends. First, many urban districts have experienced enrollment decline in recent decades. Second, demographic changes have reshaped the racial composition of the student body. In urban districts, a substantial portion of their students now comes from minority backgrounds. Third, as middle-class families relocate to suburban communities, urban schools experience a continual growth in their low-income student population. The urban political reality is equally challenging to public schools. While cities are losing their influence in the state legislature due to population decline, teachers' unions continue to place budgetary demands on the district. In other words, policymakers and educators in urban districts must confront a bundle of political and social chal-

lenges that are embedded in the broader societal structure—residential choice, locational density, suburbanization of political power, and socioeconomic characteristics of the school population.

To counter these challenging trends, urban school districts have attempted governance reforms aimed at raising school quality and outcome-based performance. There are, to be sure, substantial intercity variations in the scope and nature of the school reform strategies. Frequent turnover of urban superintendents has contributed to a policy pendulum that sways from one end of the continuum to another. A recent example is Memphis, a district touted for its effectiveness in implementing "whole school reform" for several years. Within a few months in office, the succeeding superintendent conducted an internal audit and eliminated all the "whole school strategies" in the district. Clearly, programmatic variation merits a more systematic understanding of the political underpinnings that frame the terms of school reform.

The rise of accountability-based initiatives has changed the landscape of school governance in urban districts. Accountability has created new political demands for "generalist" leaders, such as mayors and governors, to exercise more direct control over the central bureaucracy in education. The new accountability focus also raises questions on whether interest groups are able to conduct their business as usual without losing credibility and support from the public. An increasing number of parents, particularly in low-income minority neighborhoods, are supportive of choice-based programs that promote competition in the educational sector. In other words, innovation in urban school governance may signal a new phase of institutional transition where politics of the status quo are subject to mounting pressure to incorporate the new rules of accountability.

Kenneth K. Wong

POLICY TO PROMOTE EQUAL EDUCATIONAL OPPORTUNITIES

Public education faces the challenge of income inequality and racial/ethnic disparities in our society. In the early 2000s, one-third of the nation's public-school

student population is eligible for free and reduced-price lunches. In the nation's largest central city school districts, over 60 percent of the students are eligible for the school lunch program. African American students constitute over one-third of the enrollment in large central cities as compared to 17 percent nationwide. A similar trend is seen in the growing Latino population. Schools that have a higher concentration of minority and low-income students are less likely to recruit qualified teachers, offer strong curricula, and maintain high academic performance.

The pervasive impact of poverty and racial/ethnic inequality in public schools raises a fundamental tension in our federal system of government. Given our decentralized system of governance, what is the role of government in addressing social redistributive needs? Decentralization is clearly prevalent in public education, where power and decisions are dispersed among fifty states and 14,000 districts. Historically, state and local governments paid limited attention to the educational needs of disadvantaged students, whose parents were often not well organized and whose neighborhoods were less likely to be economically vibrant. States and districts tended to marginalize schooling opportunities for segments of at-risk populations.

The structural tension between decentralization and equity constitutes a policy challenge. On the one hand, the U.S. Constitution recognizes the rights of the states to handle their own affairs, including public education. On the other hand, there is pressing public responsibility to address the needs of those who are less fortunate. An understanding of how the government manages this tension between local control and social responsibility lies in the distribution of power and functions between layers of government. This entry will examine the evolution of the federal role in formulating redistributive policy to address income and racial/ethnic disparities in public schools. Particular attention will be given to the largest federal policy, Title I of the *Elementary and Secondary Education Act*. Patterns of conflict and cooperation between the federal and the local government in redistributive education policy will also be discussed.

FEDERAL GRANTS SYSTEM

As discussed in the section on governance and policy, the federal government has assumed greater respon-

sibility to promote equal educational opportunity. Financial commitments and support from state and local government on redistributive policy, however, have remained somewhat mixed over time.

Research on federalism has looked for structural sources in explaining why antipoverty policy is more likely to come from the national government. The federal government enjoys a broader revenue base in which taxes are primarily raised on the ability-to-pay principle, and it represents a constituency with diverse demands, including views that are not often supported by the majority (Oates 1972; Peterson, 1995; Wong 1999). In other words, it has both the fiscal capacity and the political justification (often facilitated by organized interest groups) to take a more active redistributive role.

Federal engagement in redistributive policy is depicted in its spending priorities. According to an analysis of federal spending in public schools between 1970 and 2002, Wong found that federal aid to redistributive programs showed persistent growth in real dollar terms (using 2002 dollars). During the thirty-two-year period, these programs increased from 36 percent to 63 percent of the total federal spending in elementary and secondary schools. The school lunch program, for example, increased its funding from \$299 million in 1970 to \$10,324 million in 2002. Head Start jumped from \$326 million to over \$6,500 million during this period. However, federal redistributive support slightly declined from 60 percent to 58 percent of the total federal school spending during 1985 and 1990. A similar decline occurred between 2000 and 2002 when special needs funding dropped from 66 percent to 63 percent of the total federal budget for public schools.

Further, federal redistributive grants have taken on several institutional characteristics that resemble a policy framework:

1. Grants-in-aid arrangement: where federal government provides the dollars and sets the programmatic framework, but the delivery of services is up to the state and local agencies.
2. Categorical or single purpose grants: where well-defined eligible students are the intended beneficiaries; only they would receive the services.
3. Supplementary and nonsupplanting guidelines: they are designed to guard against any

local tendency to shift federal resources away from the disadvantaged.

4. Bipartisan support: Special needs programs are often connected to well-entrenched political interests. For example, the child nutrition program (free lunch program) is supported by the agricultural business.
5. Incentives for local government to meet anti-poverty objectives: Federal funds are widely distributed to ensure broad political support. The territorial impact of federal grants has contributed partly to the popularity of Title I in Congress over time. For example, in the 1990s, the federal grant provided supplemental resources to 64 percent of all the schools in the nation, covering virtually every congressional district. Clearly, big city districts are not the only beneficiaries of compensatory education funds. Indeed, over 20 percent of federal aid goes to districts with fewer than 2,500 students. Districts with enrollments between 2,500 and 25,000 receive almost 45 percent of the funds. Because there are Title I programs in almost every congressional district, partisan conflict has generally been limited during the appropriations process.

While redistributive grants-in-aid have gained bipartisan support over time, this policy arrangement faces its most serious, albeit brief, political challenge in the mid-1990s. The 1994 midterm elections produced the first Republican majority in Congress in forty years. The new congressional leadership claimed a public mandate to shrink the federal role in social programs and to shift programmatic authority to state and local governments. The federal bureaucracy was depicted as a major source of waste of taxpayers' dollars, and the private sector as the solution to social inequality.

Political confrontation between the Congress and the President became highly visible in education policy during 1995. The Republican leadership, for example, proposed to significantly cut major redistributive programs, including Title I and bilingual education. To demonstrate its control over governmental appropriations, the Republican leadership shut down all federal agencies when the budget expired. In the end, however, the retrenchment tactics

backfired. Within two years, education policy regained bipartisan support in the Republican Congress.

Although federal redistributive education policy has survived its most serious political challenge, its effectiveness was increasingly called into question in a broadened climate of outcome-based accountability. The passage of the *Improving America's Schools Act of 1994* signaled the beginning of federal efforts to address accountability in its anti-poverty programs. This legislation aimed at reducing program isolation of at-risk students from their peers, created incentives for whole school reform, and required districts and states to use their system wide standards to assess the performance of at-risk students. The enactment of the *No Child Left Behind Act of 2001* further consolidates the federal expectations on outcome-based accountability in its redistributive educational policy. Schools and districts that fail to make adequate yearly progress (AYP) and reduce achievement gaps after several consecutive years are now subject to a series of interventions, including school choice and takeover by the state board. In short, federal expectations have broadened to include outcome-based accountability in redistributive initiatives.

IMPLEMENTATION LESSONS

Over the last forty years, the redistributive goals of the federal government, have received a mixed degree of support from state and local school boards. The following discussion on how local and state agencies implement and manage federal programs will provide useful information on the complexity of implementing redistributive goals in an intergovernmental policy system.

As part of the federal government's "War on Poverty," Title I of the 1965 *Elementary and Secondary Schools Education Act* (ESEA) was passed to provide financial assistance to local education agencies serving areas with high concentrations of children from low-income families. Although antipoverty remains the primary goal of Title I, its dominant policy objectives have broadened over time. The first two decades Title I policy primarily focused on fiscal accountability. The federal government required states and districts to use federal money only on schools with the highest concentrations of poverty, to spend as much money on Title I schools as on schools not receiving federal education dollars, and

to use Title I funds only as a supplement to local spending and not for general operating functions. Many states and districts found these federal requirements burdensome. By the 1980s, however, the cooperation between the federal government and local authorities brought about an easing of tight regulations and audits. This, in turn, focused attention on improving the quality of instruction and student achievement in Title I schools. The latest phase in the development of Title I was shaped by competing visions of how to raise student performance, including whole school reform, district-based support, and voucher programs.

The first phase of Title I implementation occurred during a period of policy formation and intergovernmental bargaining. Given the “newness” of the federal policy, it came as no surprise that state and local educational agencies did not fully comply with the federal intent. For example, a 1969 study conducted by the NAACP Legal Defense Fund found that federal Title I funds were being used for “general school purposes; to initiate systemwide programs; to buy books and supplies for all school children in the system; to pay general overhead and operating expenses; [and] to meet new teacher contracts which call for higher salaries” (McClure and Martin 1969). Similarly, Jerome Murphy’s (1971) analysis of Title I program in Massachusetts found state reluctance to intervene when local agencies divert federal resources away from the eligible populations. There was an absence of countervailing influences, such as Title I parental groups, to balance the entrenched organizational interests of state and local agencies. In other words, federal resources set aside for the at-risk populations often failed to go to the intended beneficiaries. Consequently, throughout the 1970s, the Congress adopted an exceedingly well-defined set of regulations to make sure that the intended beneficiaries receive the services.

As the federal government increasingly clarifies its anti-poverty intent, state and local agencies seem more ready to meet programmatic standards. Based on a comparative analysis of federal roles in education, health care, and housing and community development, P. E. Peterson, B. Rabe, and K. K. Wong (1986) documented various patterns of state and local response to federal expectations. Two major implementation patterns evolved during this second implementation phase. While intergovernmental

collaboration expanded in educational activities that were connected to economic growth, conflict continued to occur in redistributive programs. The lack of full federal funding to meet mandated standards can be a source of intergovernmental contention. The federal government, for example, promised to provide 40 percent of the funds for special education but, in reality, its funding level seldom went over 25 percent of the program cost. Local and state agencies were also reluctant to restructure their practices in part because they were not sure if the federal priority would remain unchanged over time. Perhaps most interestingly, Peterson, Rabe, and Wong observed that intergovernmental tension became increasingly manageable as professional communication and exchange grew with the passage of time. On Title I issues, local, state, and federal administrators were able to resolve disputes on funding irregularities. For example, following a 1973 adverse federal audit, Milwaukee school officials restructured their Title I administration to coordinate all fiscal decisions (Wong 1990). The district’s central office program manager was given additional authority over grant applications and regulatory compliance. Program monitoring at the building level occurred more frequently, and more extensive parental participation began. The Title I management was strengthened with the transfer of additional staff from the student testing office, the budget and planning division, and the office that oversees intergovernmental aid. As a result, many of the original federal charges were dropped. While the federal government initially asked for a refund of \$5.9 million in the 1973 audit findings, the school district was finally penalized for only \$120,266, covering inappropriate expenses on an “environmental education mobile laboratory” and “field trips” that had served all students, and Title I summer programs that had supplanted local funds. As a Title I administrator summarized the federal-district relationships since the administrative reforms, “Implementation problems are usually solved over the phone.”

COMPETING STRATEGIES

As policy makers sharpen their focus on standards and accountability, implementation shifts from fiscal audit to strategies that are designed to raise stu-

dent achievement in Title I policy. There are, to be sure, competing approaches for redesigning low-performing public schools.

Comprehensive School Reform

With the 1994 *Improving America's Schools Act* (IASA), Congress established an ambitious agenda for systemic improvement in Title I schools. Two provisions in this legislation have significant implications for schooling opportunities: (1) districtwide performance standards must apply to all students including those receiving Title I services; (2) schoolwide initiatives are promoted in Title I schools with at least 50 percent low-income students (this threshold was lowered to 40 percent in the 2001 *No Child Left Behind Act*).

Additional federal resources provided under Public Law 105-78 (*Obey-Porter Act* 1997) also facilitate schoolwide reform through support of the Comprehensive School Reform Demonstration Program (CSRDP) in Title I schoolwide programs. IASA and the *Obey-Porter Act* provide a set of legislative expectations that research suggests is essential to any high-functioning school. These expectations include:

1. A comprehensive assessment of student performance in relation to state/district subject-area content and assessment standards. States must develop measurable goals and benchmarks for meeting those goals.
2. An instructional program grounded in effective research-based methods and strategies.
3. High-quality professional development for teachers, aides, and other support personnel.
4. The development and implementation of strategies to increase parental and community involvement.
5. Strategies to identify how federal, state, local, and private resources will coordinate services to support and sustain the reform program.

Evaluation of the first phase of CSRDP reform has been mixed. One study observed that few reform models have substantiated their claims with hard evidence and that schools have adopted approaches without taking local circumstances into full consideration. Further, only three of the twenty-four whole

school reform models revealed strong evidence of positive effects. However, several case studies have identified effective strategies (Berends et al. 2002; Bodilly and Berends 1999; Stringfield et al. 1997). Based on a national study of thirty-two schools in nine urban and three countywide districts during 1998/99, higher performing schoolwide programs show strong implementation of student performance goals, academic standards and assessments, enriched curriculum, student-centered instruction, and evaluation of student performance (Wang, Wong, and Kim 1999).

Schoolwide Initiative

One aspect of Title I that received particular attention was its use of "pullout" practices. Students in Title I schools were often pulled out of regular classrooms in order to receive specialized instruction as a way to meet fiscal accounting requirements. This form of pulling out, or fragmentation, was counterproductive in meeting the educational needs of disadvantaged students. Further, school environments with a high proportion of poor students created concentration effects wherein both poor and non-poor students had a disproportionate educational disadvantage (Wilson 1987; Kennedy, Jung, and Orland 1986; U.S. General Accounting Office 1992).

To reduce fragmentation, address ineffective programs, and develop the overall capacity of Title I schools, Congress gradually approved schoolwide reform. In 1988, the Hawkins-Stafford Amendments required the coordination of Title I (called Chapter 1 at that time) with regular instructional programs and allowed schoolwide programs in schools that had at least 75 percent of the students falling below poverty level. The 1994 *Improving America's Schools Act* and the 2001 NCLB further encourage schoolwide initiatives. Title I schoolwide funding frequently supported:

1. Hiring additional staff to reduce class size and to strengthen the relationship between the school and families (Millsap, Turnbull, Moss, Bringham, Gamse, and Marks 1992).
2. Facilitating district activities that promote parental involvement, such as home-based education (Millsap et al. 1992).
3. Implementing or significantly strengthening

- staff development activities, including training in reading/language arts and mathematics instruction, as well as instruction for low-achieving students (Schenck and Beckstrom 1993).
4. Encouraging increased teacher input into decisions affecting the school; emphasizing teacher input into decisions about assessments.
 5. Introducing or significantly strengthening components related to curriculum and instruction, such as computer assisted instruction, supplemental instruction, provisions for extended school days and programs such as "Reading Recovery" and "Success for All" (Schenk & Beckstrom 1993; Millsap et al. 1992; National Association of State Coordinators of Compensatory Education 1996).
 6. Individualizing instruction to flexibly meet the needs of particular students as they arise (Stringfield et al. 1997; Millsap et al. 1992).
 7. Adopting practices associated with effective schools, including needs assessment, staff development, changes in classroom instruction, and changes in school management (Turnball, Zeldin, & Cain, 1990; U.S. Department of Education, 1992; Millsap et al. 1992). Effective school components strengthen principal leadership; produce meaningful, universally agreed upon goals; maintain a well-qualified staff; and develop organizational mechanisms that support problem-solving (Stringfield et al. 1997).

Although schoolwide reforms have become popular in high-poverty schools, coordination between Title I and the regular curriculum remains a challenge and often relies almost entirely on informal meetings; staff planning sessions rarely occur. Further, local districts remain largely uncertain about student needs assessment and program evaluation, areas where federal and state agencies can provide crucial technical assistance.

District Capacity-Building or School Choice

Further, the *No Child Left Behind Act of 2001* grants state and local agencies substantial authority in taking corrective actions to turn around failing schools. Corrective actions can take two reform

paths. One reform strand relies heavily on district and state capacity to play a supportive function. For example, Chicago, following mayoral control of the school system in 1995, has sharpened its focus on low-performing schools and their students. Low-performing schools were put on probation and, in a few cases, reconstitution. Failing students are required to attend summer programs and social promotion has been terminated. The combination of sanctions and support seems to have improved the overall conditions to support student learning in the district.

A different reform strand is school choice. Low-performing, inner-city schools have been the target of experimental vouchers, where parents are allowed to move their children from low-performing public schools to better-performing public and nonpublic schools (Kantor and Palmaffy 2002). Following the state-funded voucher experiments in Cleveland and Milwaukee, Congress has approved a federally funded voucher program for low-performing, low-income students in Washington D.C. in 2004. Whether these programs will raise student performance remains a key reform issue.

In sum, as the federal government launches its ambitious educational plan in the *No Child Left Behind Act*, it remains to be seen whether local and state agencies are capable of meeting the goal of narrowing the achievement gaps among various subgroups of students (Peterson and West 2003; Kim and Sunderman 2004). Furthermore, accountability no longer remains within the confine of the educational professions. Accountability-based politics has been facilitated by "issue expansion" in education among governors, mayors, and state high courts. As school reform attracts greater attention from policy generalists, the degree to which these political actors contribute to the implementation of the 2001 federal *No Child Left Behind Act* remains a key issue. In the long term, the critical challenge lies in the commitment of our intergovernmental system to fully address income and racial/ethnic disparity. Toward this end, a functional, federally funded policy system will continue to play an instrumental role in mediating the tension between decentralized governance and social redistribution.

Kenneth K. Wong

STATE EFFORTS TO EQUALIZE SCHOOL FUNDING

Over the last two decades, state government has assumed primary fiscal responsibility in the delivery of K–12 educational services. Federal funds have fluctuated between 6 percent and 10 percent of public elementary and secondary education revenue in the last several decades. While local property tax remains a key source, its significance has steadily declined. In his longitudinal analysis of educational funding across the fifty states, Wong (1999) found that the state share was only 38.3 percent in 1959. A reversal of responsibility between local and state governments occurred during the late 1970s and early 1980s. Due to local fiscal retrenchment, responsibility for funding education shifted from local to state sources. Since the mid-1980s, the state share of total school revenues has either exceeded or stayed close to the 50 percent level. The prominence of state fiscal support signals the rising influence the state may have in determining how the K–12 education pie will be divided in response to competing demands in the policymaking process.

During the 1990s, states have maintained relatively stable levels of funding responsibility. The average percentage of elementary and secondary revenue provided by states is close to 50 percent, but there is much variation to be noted. At the extremes are Hawaii, in which almost 90 percent of elementary and secondary school revenue is provided by the state, and New Hampshire, where less than 10 percent of revenue came from the state in the late 1990s. (Hawaii is a special case because it has only one school district. Hawaii is not included in analysis of intrastate equity, that is, between districts, due to this feature of its public education system.) The ten states with the highest funding responsibility supply nearly two-thirds of their annual education revenue, while states with low-funding responsibility supply only about one-third of their state's education budget.

What accounts for the variation in state fiscal roles across the fifty states? What are the political and institutional factors that contributed to a greater state share of the school funding? And what are the political constraints?

CONSTITUTIONAL CHALLENGES

A key factor that accounts for higher level of state responsibility and contribution to education revenues lies in reform efforts to reduce funding disparity across districts. School finance litigation and court rulings have heightened the public attention to interdistrict inequalities (Wise 1972; Guthrie, Garms, and Pierce 1988; McDermott 1999). The structure of the plaintiffs' argument is seemingly straightforward—disparity in local taxable wealth is closely linked to spending differences, which contribute to inequities in schooling opportunities and quality. In virtually all judicial challenges, taxpayers in districts with low property values are found to carry heavy tax burdens. Students in these high-tax, low-wealth districts do not seem to benefit from the fiscal well being of the state as a whole.

Over the last thirty years, about half of the states have either faced rulings or are in the process of dealing with major law suits that challenge the constitutionality of the state finance system in public education. State high court rulings have shifted in favor of the plaintiffs in the last three decades. The number of decisions in favor of the defendant states declined from seven in the 1970s to six in both the 1980s and the 1990s. At the same time, the number of rulings that declared state funding systems unconstitutional increased from five in both the 1970s and the 1980s to eleven in the 1990s. In other words, while 58 percent of the decisions in the 1970s were in favor the status quo, 65 percent of the rulings challenged the status quo during the 1990s. In 1997 alone, the courts found the funding systems in Ohio, Vermont, and New Hampshire unconstitutional. Consequently, the eighteen states that violated their constitutions had to restructure their funding systems to reduce interdistrict inequity.

Judicial involvement in reforming the statewide school finance system started in 1967 in California when John Serrano and other parents, concerned about poor school services for their children in the Los Angeles area, brought a class action suit against the state of California. In the landmark ruling, *Serrano v. Priest*, often referred to as *Serrano I*, the California Supreme Court handed down a six-to-one decision in favor of the parents. According to this ruling, significant interdistrict disparities in school spending due to uneven distribution of taxable wealth

violated the equal protection provisions of the state constitution. In this case, sharp disparity in school spending existed between the wealthy Beverly Hills district and the nearby Baldwin Park district. While the former had a tax rate that was less than half as much as the latter, it was able to come up with twice as many school dollars on a per-student basis during 1968/69. As the court opinion stated, “affluent districts can have their cake and eat it too; they can provide a high quality education for their children while paying lower taxes. Poor districts, by contrast, ‘have no cake at all’” (*Serrano v. Priest* 1971). Shortly after the court decision, the California legislature adopted what became the first of several school finance reform plans during the 1970s (Levin et al. 1972; Kirst and Somers 1981). At the same time, parent plaintiffs in several other states filed similar charges.

However, within two years, *Serrano I* was brought into question by a U.S. Supreme Court ruling on a case in Texas. In *San Antonio v. Rodriguez*, a five-to-four decision reversed a federal district court ruling (1973). It concluded that since education does not constitute a fundamental interest under the U.S. Constitution, the state can choose to preserve local control by not interfering in interdistrict fiscal inequities. In line with *San Antonio*, the supreme courts of Arizona (1973), Washington (1974), Oregon (1976), Colorado (1976), Idaho (1975), and several other states ruled that the statewide system did not violate the state constitution despite interdistrict funding inequity.

Despite *San Antonio*, the pressure for a more equitable allocation of state funds continued. Among the most significant state rulings that rejected the local control notion in *San Antonio* was *Serrano II* (1976) in which the California high court found the state funding system in violation of the state constitution. In the post-*Serrano II* period, the state supreme courts in Washington, Wyoming, and several other states also ruled as unconstitutional the state school financing system. Costly services for special needs students were brought to the states’ attention by big-city districts in several legal suits, including the 1978 *Seattle v. Washington*. Further, the court overturned the school funding systems in Texas (1989), Kentucky (1989), New Jersey (1990), Vermont (1997), Ohio (1997), and New Hampshire (1997).

The New Jersey ruling, in contrast to rulings in

most other states, paid particular attention to the concentration of social needs in inner-city schools. The court, in that case, recognized additional costs to address the needs of disadvantaged pupils in urban areas, estimating that programs to “reverse the educational disadvantage the children start out with” in urban districts would cost about \$440 million for the first year. Immediately following the court decision, the Democratic governor proposed \$2.8 billion in new and increased taxes to fund new services for the poorest schools. However, the reform and tax-increase plan was substantially compromised following key Republican wins in the gubernatorial and legislative election. After years of fiscal conservatism under governor Christine Whitman, the new Democratic administration of James McGreevey tries to address the intent of the Abbott decision despite an economic downturn in 2002.

State funding systems are increasingly being challenged from an “adequacy” perspective. Simply put, adequacy is the notion of providing a sufficient amount of instructional services so that students in low-income and at-risk circumstances can perform to meet state academic requirements. Starting in the mid-1990s, the Committee for Fiscal Equity, a citywide coalition of school advocacy groups in New York City, launched a legal challenge against the state for inadequate state funding to support students in the city in meeting the rigorous learning standards. In 2001 the trial court judge, Leland DeGrasse, ruled that the state should provide additional resources to the city so as to ensure that the students meet “an educated citizen standard.”

POLITICS OF LEVELING UP FUNDING SUPPORT

Judicial impact has not been confined to states where the funding systems were successfully challenged. Judicial pressure and, in some cases, perceived judicial challenge, have brought about reform in the state aid allocation. Utah and Washington, for example, have “foundation programs” establishing base-line revenue for students in poor districts. Districts are required to levy local property taxes up to a state-designated maximum. State dollars are channeled to make up the difference between local tax revenue and the minimum level of school spending. To supplement the foundation programs, many states have

adopted various complicated multi-tiered schemes. Under “power equalizers,” state aid guarantees an equal amount of local tax returns at different levels of tax levy. Further, several states primarily use “resource equalizers” that either specify the state share in local spending (known as percentage equalizers) or equalize the taxing returns of districts to finance schools (known as district power equalizing). Unlike foundation programs, equalizing systems do not place a fixed dollar limit on state support.

Increase in state aid is often a result of political bargaining. In order to gain a legislative coalition for a reform package, policymakers often adopt the “leveling up” strategy where no districts would suffer a reduction in their state support. Taxpayer dollars may be more widely distributed in two-party competitive states where political elites want to see their constituencies benefiting from state allocation.

In other words, an increase in state transfers to poor districts was seldom achieved at the expense of the more affluent communities. These electoral concerns had substantially shaped the final legislative outcome to address interdistrict inequity in Kansas, California, New Jersey, New York, and Washington (Berke et al. 1984). Texas offers a good example of the politics of sectoral rivalry. In 1989, Texas’ educational finance system was ruled unconstitutional. In a 9–0 reversal of the appellate court’s ruling, the state’s supreme court pointed out, “Districts must have substantially equal access to similar revenues per pupil at similar levels of tax effort. Children who live in poor districts and children who live in rich districts must be afforded a substantially equal opportunity to have access to educational funds.” (*Edgewood Independent School District v. Kirby* 1989). The ruling set off fierce partisan conflict and interest group contention that lasted three years. Having gone through various reform plans, the Republican governor and the Democratic-controlled legislature produced a compromise bill in 1990. Senate Bill 1 would have provided \$500 million more to the state’s 1,056 districts; in other words, no district would come out as a loser. However, the seemingly modest increase in state support and the scattering of these funds prompted a district judge to reject the plan (*Education Week* October 3, 1990). The prospect of school finance reform was substantially enhanced with the election of a Democratic Governor, Ann Richards, whose campaign included state edu-

cational funding as a key issue. After numerous delays and last-minute give and take, the governor and the legislature produced yet another legislative proposal in June 1993. The proposed reform called for the state to reallocate “excess” local tax revenues from the richest 10 percent of the districts to support the statewide teacher retirement system, thereby freeing more state funds for the poorest districts. The plan would use property taxes collected from the affluent communities to support schools in the fiscally depressed communities. While the plan was shaped by the Robin Hood principle, it did not commit additional state tax dollars. In other words, the state’s political leaders remain constrained by middle-class concerns and have made no serious attempt to call for an increase in state taxes to fund schools.

FEDERAL PROGRAMMATIC STIMULATION

The prominent state role in school spending has been further encouraged by the adoption of legislation that promotes equal educational opportunity. In this regard, federal school policy during the Great Society era of the mid-1960s and the 1970s has played a crucial role. While federal funds have contributed to less than 10 percent of all school revenues, federal programmatic guidance has clearly stimulated state activity in addressing special needs. Currently, all states are providing their own funds for special education. Twenty-eight states fund their own compensatory education, and twenty-one states support bilingual instructional services.

Starting in the 1980s, however, an increasing number of states shifted from the federal categorical model to an allocative system that weights special-needs students more heavily than others in the general-aid formula. This alternative arrangement was used by only five states during the mid-1970s (Leppert et al. 1976). The shift from categorical to pupil weightings occurred at a time when states assumed greater autonomy in the climate of Reagan’s New Federalism. By the 1980s, it had become popular in distributing funds for the handicapped. Of the states that provide compensatory programs, thirteen adhere to pupil weighting and fifteen retain categorical. In bilingual education, six use pupil weighting, and fifteen allot funds through categorical grants.

States’ policy framework on equity issues can have

distributive consequences. For example, politics in California is substantially shaped by urban interests. Urban lawmakers dominate various influential legislative offices and committee chairmanships—the Speaker of the House, the President Pro Tempore of the Senate, the Chair of the Assembly’s Ways and Means Committee, the Chair of the Senate Appropriations Committee, and the Chairs of the Education Committees in the two houses (Timar 1992). To respond to their urban constituencies, the legislative leaders have funded a wide range of categorical programs. Indeed, on the average, 26 percent of the urban district’s total school funding are state categorical sources as compared to only 13 percent in the suburban districts. For example, while Los Angeles receives 31 percent of their school revenues from state categoricals, Palos Verdes only obtains 8 percent of the funds from categorical programs. In the case of California, state allocation has been beneficial to the urban districts.

LOCAL TAXPAYERS MOVEMENT

The pressure toward a greater state role has been enhanced by citizen-based campaigns against local increases in property-tax levy. Within five years following California’s Proposition 13, well over half of all states enacted some form of legislation curbing governmental spending and restricting property-tax levy increases. Between 1976 and 1990, thirty-six states experienced a property tax revolt (Mullins and Joyce 1995).

Indeed, signs of taxpayer opposition to school levies had begun to emerge prior to the passage of Proposition 13 in California in 1978. As early as 1970, a majority of school bond requests had failed to be approved by the voters at the nationwide level (Piele and Hall 1973). In California, for example, local taxpayers were so dissatisfied with a sharp increase in local school contributions during the Reagan governorship that, between 1966 and 1971, they rejected 50 percent of all local tax increases for school operation and 60 percent of the school bond levies for capital improvements (Levin et al. 1972). Discontent among property-tax payers became more widespread during the time of the much-publicized campaign of Proposition 13. According to a national Gallup Poll at the time of Proposition 13, when asked to identify their dissatisfaction with various taxing sources for public schools, 52 percent of the respon-

dents mentioned property tax, as compared to only 20 percent citing state sources (Phi Delta Kappa 1984). In 1978 alone, voters in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and several other states pushed for limitation of property-tax increases. Consequently, major property-tax limitation measures were adopted in California, Idaho, and Massachusetts.

Where the local taxpayer movement is well organized, there is evidence that the state begins to assume greater financial responsibility for local school cost (Williams 1982; ACIR 1980; Gold 1985; Gold 1983). After the passage of Proposition 13, California’s state share in nonfederal school revenues jumped from less than 50 percent to more than 70 percent. The state share also went up in Massachusetts and Idaho to make up for the lost local revenues after the adoption of tax limiting measures. The role of the state becomes more complicated where spending limits on both the state and local sources were adopted, such as in Colorado, New Jersey, and Tennessee. In these states, it is more likely that both state and local spending on education may exhibit a slow growth pattern. However, a faster rate of decline at the local level may result in an increase in the percentage of the state share.

Taxpayers’ concerns can illuminate territorial divisiveness. Illinois, during 1992 and 1997, provides a good example of how school finance reform can be frustrated by fragmentary politics. In 1992 voters opposed a constitutional referendum that would direct the state to be the primary funder in public education. The initiative was supported by 57 percent of the voters, yet 3 percent short of what is needed to enact a constitutional referendum. As expected, support was the strongest from Chicago and opposition came mainly from the surrounding middle-class suburbs. Indeed, the city-suburban rivalry is exacerbated by racial and income differences. While whites constitute only 12 percent of the enrollment in the Chicago Public Schools, students in the suburban schools predominantly come from white, middle-class families. With a Republican governor who is fiscally conservative and the senate under the leadership of a Republican from a middle-class suburb west of Chicago, it seems unlikely that the state legislature would launch any major reform in school finance. Then politics took a dramatic turn in 1997 when the governor reversed his earlier position on school fi-

nance reform. When the legislature rejected his proposal to increase state income tax to lower the local tax burden in funding schools, the governor returned with a new reform package that would rely on users fees and sales taxes. The 1997 “compromised” reform legislation would guarantee a foundation level of \$4,225 to every student in the state for three years beginning in the fall of 1998. At least for a brief period of time, fragmentary politics gave way to coalitional politics in Illinois.

Michigan, prior to 1993, offered another example of what happens when state aid to schools does not receive statewide political support. In part due to the recession and the decline of the auto industry, Michigan experienced the steepest decline in state share in school costs over the years studied among the parity-stable group. The state’s limited role is seen in two different examples; one relates to Detroit and the other to a small rural district. Detroit, the state’s major city, is clearly isolated from the governing institutions at the state level. The state-city relations had deteriorated during the long tenure of Mayor Coleman Young. In addition, the demographics have worked against the city. While Detroit maintained 22 percent of the house seats in the 1960s, it controlled fewer than 14 percent of the seats in the 1980s. The suburban communities, on the contrary, now hold 30 percent of the house seats. Just at the time when Detroit’s influence was in decline, the state legislature had become increasingly reluctant to provide additional aid to the city schools. In 1973, for example, the state legislature raised the minimum level of required local levy, which was substantially higher than what Detroit was taxing at the time (Mirel 1993). To avoid risking a significant loss in state aid, Detroit had to impose a higher millage on its already shrinking property-tax base. Although Detroit presently receives more than half of its revenues from the state, there is very limited political support for a more activist state in general. The latter point is illuminated by the failure of the state to intervene in the Kalkaska district in the rural northwestern lower-peninsula area (*New York Times* March 21, 1993). The district’s levy proposal has been rejected three times by the community, whose residents are mainly retirees with no school-age children. In response to the district’s appeal for \$1.5 million in state aid to keep the school open for ten more weeks, the state legislature cited that the state

codes could not compel the district to stay open (unlike California laws). In the absence of a state subsidy, the district was forced to close the schools ten weeks early. In short, even in a fiscal crisis like the one in Kalkaska, the state leadership, restrained by a broader taxpaying constituency, decided not to step in and assume greater responsibility in educational funding.

In late 1993 Michigan politics took a dramatic turn, when the Republican governor and the legislature produced a compromise that would replace two-thirds of the local property tax revenues with state taxes. Among the facilitating factors for the bipartisan reform was the fact that Michigan’s property tax burden was 30 percent higher than the national average (ACIR 1992). Michigan voters subsequently approved a measure that raises the state sales tax from 4 percent to 6 percent, increases the tax on cigarettes by three times, and creates other users fees (Federal Reserve Bank of Chicago 1994). The adopted measure also slightly reduces the state’s personal income tax from 4.6 percent to 4.4 percent. Clearly, the plan reduces the property tax burden for homeowners, and to a limited extent, business property owners as well. It remains to be seen whether the shift to a greater state role would actually reduce the disparity between the have-nots (such as Detroit and rural districts) and the haves (such as suburban communities outside of Detroit).

A key policy question is whether the state’s leveling-up strategy has the effect of narrowing the gap in fiscal capacity among districts. Using the latest available state-by-state information, Wong (1999) analyzed the extent to which disparity persisted between the fifth and ninety-fifth percentiles of the districts in each state. There are, to be sure, interstate variations. Seven states had a fairly wide disparity gap that exceeded 0.40 (or 40 percent of the per-pupil spending). These included Alaska, Illinois, New Hampshire, Montana, Vermont, Kansas, and Arizona. In contrast, nine states had a modest disparity gap of less than 20 percent between the haves and the have-nots. These were California, Washington, Alabama, Delaware, Iowa, North Carolina, West Virginia, Florida, and Nevada. The exceptions are Hawaii and Washington D.C., both of which are basically unitary systems without subdivisions.

Kenneth K. Wong

CITY AND STATE TAKEOVER OF DISTRICTS AND SCHOOLS

City and state government takeover as a school reform model focuses on district-level capacity to reduce institutional fragmentation and raise academic accountability. This kind of systemwide restructuring is based on several organizational principles that:

- recognize that the existing political structures are not easily alterable;
- empower the district and state level administration to intervene in failing schools;
- enable city hall to manage conflicting interests and reduce fragmentary rules; and
- integrate political accountability and educational performance standards at the systemwide level (Wong 1992, 1999).

Integrated governance as a reform approach enables the mayor or state officials to rely on systemwide standards to hold schools and students accountable for their performance. To improve outcome-based accountability, integrated governance often imposes sanctions on and provides support to low-performing schools (Wong 1999). Failing students are no longer promoted to a higher grade but are required to attend summer instructional programs.

Indeed, integrated governance has gained national attention. The hallmark of the Bush administration education plan is to increase accountability for student performance through a system in which “states, districts and schools that improve achievement will be rewarded [and] failure will be sanctioned” (*No Child Left Behind*). In light of the growing prominence of the integrated governance approach, school reform is likely to be shaped by the ways in which the current, largely insulated, school bureaucracy moves toward accountability and coordination. This entry is concerned with the takeover aspects of the integrated governance school reform model.

EMERGENCE OF SCHOOL DISTRICT TAKEOVER

A growing number of states and city governments have developed policies to deal with failing school districts or failing schools (Cibulka and Derlin 1998; O'Day

1997). Implementation of takeover reform has increased over the past decade. The incidences of takeovers occurred for various reasons. As of the early 2000s, the peak of takeovers came during the three-year period from 1995 to 1997. Thirty-eight percent (15 of 40) of takeovers occurred during these three years, including the highly publicized takeovers in Chicago (1995), Cleveland (1997), and Baltimore (1997).

In Maryland, for instance, schools can be reconstituted if they have been falling below a certain standard of performance and have been declining in performance over several years. Schools can develop a transition plan to avoid reconstitution by the state. State monitoring and some initial additional funds are provided until the school has improved sufficiently to warrant being taken off the list (none have been thus far). If a school fails to improve, the state reserves the right to reconstitute the school, including instituting management by an alternative provider (Cibulka 1999; Michaels and Ferrara 1999).

Takeovers have also grown broader in scope over time. While most states have had provisions for state takeover of local school districts, states rarely invoked them, except in cases of clear financial mismanagement or illegal activity (Cibulka 1999). Before the 1995–97 takeover peak, 60 percent of takeovers were for purely financial and/or management reasons, while only 27 percent were comprehensive takeovers that included academics. In the three years after 1997, however, the percentage of comprehensive takeovers rose to 67 percent and the percentage of takeovers solely for financial and/or management purposes dropped to 22 percent. The general trend, following on the heels of the big-city takeovers in 1995–97, is for city/state takeovers to involve more than just financial management.

Some of the more recent state takeover laws focus more on breaches of academic accountability. Twenty-four states allow state takeover of local school districts, permitting state officials to exert authority over a district in the case of “academic bankruptcy,” or woefully low-performing schools, but only eleven states have exercised the law. Even when intervening, states often refrain from entirely dismantling the local school district administration, such as the school board and the superintendent. A majority of state takeover laws allow state administrators to influence decisions behind the scenes in a more limited fashion in academically troubled districts, first giving

schools or districts an opportunity to improve before more drastic measures are taken (Cibulka 1999).

When takeovers do occur, the duration of the takeover is linked to its scope. The overwhelming majority (ten of fourteen) of completed takeovers (where local control has been re-established) are takeovers that do not involve academic reform. State policymakers who initiated takeovers were keenly aware of the challenge, "Improving student achievement takes time" (Lewis 1997). This is seen in the fact that only four of the twenty-three takeovers involving academics have been completed. The rest remain in progress, and may remain in progress for a long time. The comprehensive takeovers, which include financial, managerial, and academic components, last the longest. Only one of the comprehensive takeovers has been completed, and it is the oft-cited state takeover of Logan County, West Virginia. Todd Ziebarth (2000), Kevin Bushweller (1998), and Richard Seder (2000) all quote local officials who "credit the success of the takeover to working collaboratively with the local school board during the takeover" (Seder 2000). The remaining comprehensive takeovers are still in effect, and seven of the fourteen have been in place for more than five years.

What are the effects of takeover reforms? The following discussion examines three potential effects that takeovers are designed to produce: (1) higher student performance, especially in the lowest performing schools; (2) more effective financial and administrative management; and (3) improved public perception of the school district through greater accountability.

Higher Student Performance

Aggregated to the district level, it is difficult to make generalizations about whether takeover reform is working as a means to improve student achievement. On one hand, there are many examples of improvement in student performance after both city and state takeovers. On the other hand, however, there are also many counter-examples of recent decline. In Cleveland, for example, from academic school year 1998/99 to 1999/00 there were improvements in reading proficiency in grades 1, 3, and 5, but at the same time declines in grades 2, 4, 7, 8, and 10. Cleveland also saw gains in math in grades 1, 3, 5,

6, 7, and 9 during the same period in which grade 11 declined.

While comparisons across districts are not possible given the use of different achievement tests, it is enough to note that there are not consistent year-to-year trends across districts. Although districts may gain significantly in one year's time, these gains are not necessarily sustained. In short, at the district level there is no clear story on achievement and either mayoral or state takeover. We next turn to school-level analysis.

Examinations of school-level analysis in Boston, Chicago, Lawrence, and Compton lead to four broad observations regarding the relationship between academic performance and school district takeover (Wong and Shen 2003). First, mayoral takeover in Chicago and Boston seems an important factor in raising student achievement at the elementary grades. Second, gains in achievement in Chicago and Boston are especially large for the lowest performing schools, suggesting that mayoral takeovers involve a special focus on these failing schools. Third, mayoral takeover in Chicago and Boston seems less effective for the upper grades, where the cumulative effects of many years of poor schooling are not easily reversible. Fourth, when state takeovers produce administrative and political turmoil, student achievement suffers. After a period of adjustment, however, state takeovers may also be able to produce positive achievement gains.

Gains in Elementary Grades In Boston and Chicago, elementary schools were improving their standardized test scores in the late 1990s. In Boston, the percentage of students failing the Massachusetts Comprehensive Assessment System (MCAS) fell in all three grades (fourth, eighth, and tenth) for both English and Math. In Chicago, the percentage of students at or above national norms on the Iowa Tests of Basic Skills (ITBS) and the Tests of Achievement and Proficiency (TAP) increased in all but one grade level from 1994 to 1997, and across the board from 1997 to 1999. In 1999, this meant that the percent of students at national norms was 9 percent higher in math and 6.6 percent higher in reading than it was in 1997.

Gains in the Lowest Performing Schools In Boston and Chicago, the lowest performing elementary schools were making strong improvements as well. Compared

to all schools in Boston, the lowest performing schools reduced the number of failing fourth grade students by almost 10 percent more in English and almost 5 percent in Math. This comparison should not be interpreted as a negative comment about the rest of Boston's public schools (outside of the bottom 20 percent). It is likely that the reason the other 80 percent of schools have a smaller change in the percent failing is because they had fewer failing students to begin with. This comparison is used to isolate the lowest performing schools to assess their progress. It is not a given that the bottom 20 percent of schools will improve, and that is why the comparison is necessary. It is conceivable, for instance, that the bottom 20 percent of schools could have seen little change while other schools in the district contributed to a large change in the district average. In Chicago, the bottom 20 percent of elementary schools made greater improvements in all grades in both time intervals. Looking, for example, at fourth grade performance, Chicago's bottom 20 percent of schools bettered the average for all schools by 5 percent in Reading and by almost 7 percent in Math. School-level analysis strongly suggests that in these two mayoral takeover cities, the lowest performing elementary schools were making gains on their standardized test scores.

Mixed Results for Upper Grades Achievement levels in the upper grades in both Boston and Chicago raise the possibility that in the upper grades, student achievement has not improved as much and the bottom 20 percent of schools have not performed better than the district average. In Boston, the percent of students (across all schools) failing the MCAS English section fell 7.99 percent for fourth graders, 5.36 percent for eighth graders, and 1.61 percent for tenth graders. In Math, the percent failing fell 12.87 percent for fourth graders, 9.08 percent for eighth graders, and 2.06 percent for tenth graders. This trend in student performance suggests that the greatest gains in student achievement are realized in the lower grades. A similar trend occurred in the percentage of students who scored at the proficiency level. In grade 10 in Boston, in fact, the percent of students proficient in English fell .61 percent from 1997/98 to 1998/99. In addition, the bottom 20 percent of schools no longer performed better than the average for all schools. Compared to the .61 percent

fall in proficiency in grade 10 English, for example, in the bottom 20 percent of Boston's high schools, tenth grade saw a 1.5 percent drop in proficiency. In Math, the average for all schools went up almost 2 percent, but the lowest performing schools made no improvement from the previous year. This is an example of the district average being driven by the higher performing schools, while the bottom 20 percent remained stagnant.

In Chicago, the same phenomenon arose in grade 9. From 1993/94 to 1996/97, the average for all schools went up 10.3 percent in math and 2.9 percent in English; the average for the bottom 20 percent of schools only rose 5.8 percent in math and 1.4 percent in English. In grade 11 in Chicago, the bottom 20 percent of schools performed about the same as the average for all schools, performing slightly worse in math and better in reading. From 1996/97 to 1998/99, the lowest performing schools did a little better in comparison with the overall average. In grade 9, their rate of improvement was almost identical to the overall average, and in grade 11, they performed 1.7 percent better in math and .9 percent better in English. The data in Boston and Chicago suggests that in the upper grades, the improvement in student achievement lessens overall and the lowest performing schools no longer improve more than the average for all schools.

State Takeover May Improve Schools Following the Initial Phase During the initial phase of state takeover, a certain degree of leadership instability tends to occur. While the state claims legitimate intervention in failing districts, local school boards and superintendents of the takeover districts can be distrustful of the state's intention. When superintendent turnovers and state-local squabbles occur, teaching and learning are adversely affected. During the initial phase of state-local conflict, student achievement declines. Once turmoil subsides, student achievement may gradually improve.

In Compton, where state takeover has been in place since 1993, students are improving their academic performance and the lowest performing schools are in most cases improving as well. From 1997/98 to 1999/00, all grade levels in the Compton Unified School District saw improvements on the Stanford 9 test. Similar to Boston and Chicago, the largest gains were in grades 2 and 3, where reading

scores went up 12.8 percent and 6.7 percent respectively. Math scores also rose. The bottom 20 percent of schools in Compton improved, and sometimes more than the average for all Compton schools. The gains seen in Compton suggest that state intervention may be more effective after it has been established for a prolonged period of time. This would be consistent with the idea that after an adjustment phase, state takeover can establish effective strategies for improving achievement. Indeed, in several districts in Alabama, Kentucky, and West Virginia, state takeovers were phased out following school improvement. In these districts, local school boards have successfully regained their independence.

More Effective Financial and Administrative Management

Analysis of the distribution of administrative and support personnel also suggests a new trend after mayoral takeover: the infusion of nonteacher administrators into management. This change was most evident in Chicago, where the percent of administrators rose significantly from 1995/96 to 1996/97. This was matched by a drop in the percent of support staff. These changes were greater than 30 percent and suggest that a more diversified management team is being put in place to run the school district (e.g. Chicago recruited a former city budget director, Paul Vallas, to act as CEO during the first six years of its takeover reform.) In Chicago, noneducators who were recruited from the private and nonprofit sector filled many top management positions. In Washington D.C. under Superintendent Paul Vance's administration, a majority of his executive cabinet were drawn from diverse professional fields, including the navy, private management, and public policy. Given these case study findings, it will be interesting to see if other takeover districts move toward a more diversified management.

Increased Accountability In Order To Enhance Public Confidence

Looking at the types of tests that districts give to their students, two trends are evident. First, many takeover districts are in states that administer content-standards assessments. Although states vary in the number of grades they test, it is clear that all of

the states in which takeovers have occurred are concerned with measuring student performance against state-defined standards. Further, in the mayoral takeover districts, there is also a strong emphasis placed on additional tests administered by the local authorities. For several years following the mayoral takeover, Chicago created and implemented its own Chicago Academic Standards Examination (CASE) in order to better test its high school students. Chicago also uses the Iowa Test of Basic Skills (ITBS) to further monitor its progress. In Detroit, the Metropolitan Achievement Test is used in addition to the Michigan Educational Assessment Program (MEAP). Baltimore employs the Comprehensive Test of Basic Skills (CTBS) and Boston uses the Stanford 9 (SAT-9).

The use of these additional measures of student assessment in the mayoral takeover cities suggests that state standards are not the only benchmark districts are concerned about meeting. Because they use more than one set of standardized tests, the mayoral takeover districts test their students more than state takeover districts do. On the average, mayoral takeover districts administer an average of 19.29 tests, while state takeover districts administer 16.67 per year. (Using testing calendars made available by each school district, we calculated the total number of standardized tests administered per year in each district for all grades. For example, in Chicago during the academic year there are a total of twenty-two tests given across all grades. In grades 3–5 and 7–8 students take two tests per year. In grade 6 they take one test per year. In grades 9–11 they take three tests and in grade 12 they take two tests per year. We made similar calculations for each of the takeover districts.) In the state takeover districts, the smaller number of standardized tests is an indication that for state takeovers, state-administered tests are most important for district evaluation.

POLICY IMPLICATIONS

City and state takeovers suggest several policy implications. First, there are significant differences between mayoral takeovers and state takeovers. Mayoral takeovers in Chicago and Boston appear to be more effective in terms of academic improvement. Mayoral takeovers may make a significant impact

on the lowest performing schools. Second, takeovers may also produce more efficient financial and administrative management, and in the case of mayoral takeovers lead to a broadening of management expertise. Third, both city and state takeovers bring with them a heavy emphasis on academic accountability, and mayoral takeovers are more likely to utilize additional tests beyond state mandated exams.

While it is still too early to know where takeovers will lead (whether to sustained improvement or falling back), the components for success include: clear and attainable goals, working together with the existing administration for a smooth transition, and making the takeover heads (e.g., mayors) accountable as well as the teachers, students, and so on. When this happens, there is some evidence that supports mayoral takeovers as a reform that can improve failing school districts. These accomplishments, however, can be tempered where there is political or administrative turmoil.

From a research perspective, the emergence of school district takeover within the integrated governance framework calls for more systematic studies that link district level reform to the school and classroom. What arrangement of integrated governance (i.e. mayoral, state, or some combination) takeover is most effective in improving learning opportunities in the most disadvantaged, inner city schools? Will the new vision of accountability improve teaching practices? Can the mayor sustain commitment to education in a system of competing constituencies? As school district takeover becomes more frequent, these are the sorts of questions that policy analysts must continue to address.

Kenneth K. Wong

SCHOOL CHOICE AS A REFORM STRATEGY

Dissatisfied with low performance in public schools, an increasing number of states are focusing on market-like competition as the driving force to raise student performance (Hirschman 1971). Proponents of school choice argue that parental choice will create the most efficient way of raising

school quality. If a low-performing school does not respond to the market-like competition, declining enrollment will ultimately close down the school. Skeptics of school choice are concerned about self-selection among those who are in the most advantageous position to use information to choose schools. Those who are left behind, according to choice skeptics, will receive lower quality schooling services.

While the debate on choice continues, policy reformers have broadened parental access to various types of school choice programs. These include public school choice (such as charter schools, magnet programs, and public schools under private management), state-funded vouchers, and privately funded vouchers. In reviewing the range of choice-based initiatives, Jay Greene (2002) developed an Education Freedom Index for each of the fifty states. This index uses four components (weighted equally) to determine the state-initiated school choice climate: charter schools, subsidized private schools, home schooling, and public school choice. According to Greene, Arizona provides the highest degree of school choice to families, while Hawaii maintains the least choice. During 2000 and 2001, Florida showed the greatest gain toward school choice, while Utah seemed to regress. Further, there are state variations across the four components. While public school choice (such as citywide magnet programs) was widely implemented, subsidized private school choice from either governmental or nongovernmental sources was absent in eleven states. Thirteen states did not have legislation on charter schools, while only two states did not allow for home schooling in 2001. Nationwide, almost 900,000 school-age children are home schooled.

CHARTER SCHOOLS

The charter school reform represents the most extensive state effort to promote choice. With thirty-seven states and the District of Columbia operating a total of over two thousand charter schools in 2001/02, charter school reform takes on a national character as an alternative to failing public schools. Across the nation, approximately two-thirds of the charter schools have a waiting list, suggesting substantial

parental demands for this type of school choice initiative. As new charter schools are established to meet rising parental demands, a key issue is the quality of the schooling opportunities provided to students in various settings. Charter schools of the 1990s are designed to circumscribe institutional constraints such as union power. By relaxing school admissions policy on student selection, public charter schools are designed to keep parents satisfied with the public schools instead of opting for nonpublic schools (Raywid 1985; Wong 1992).

Although charter schools are labeled as public schools, they are distinctive in several major aspects. The school's charter or contract explicitly states the conditions and expectations for outcome-based performance that are consistent with the state framework (Bierlein 1997; Hill 1997). The authorizing agency can be the local school board or other legal entities such as universities. Once established, charter schools enjoy substantial autonomy in setting teachers' salaries and work conditions, although they are governed by state regulations regarding safety, health, dismissal, and civil rights. School funding follows students to the charter schools, which are operated on a multiyear renewable contract. At least one district in California has converted to a system of charter schools. Enrollment in charter schools increased to about 2.5 percent of the nation's public school student population in 1999/00. In Arizona, California, and Michigan, charter enrollment figures are much higher.

Do charter schools create a competitive environment that causes regular public schools to make greater efforts to raise their performance? The rationale of competition has been widely cited, but there is a need to determine whether evidence exists to support such a claim. Research analysts and policy reformers, not surprisingly, are split on this issue (see Wong and Shen 2001).

Competitive effects of charter schools are constrained by legislative compromise. Based on interviews and policy/legal analysis in four states, Bryan Hassel (1999) found that legislative compromise has played a significant role in reducing the competitive impact of charter schools. Laws that cap the number of charter schools, cushion the financial blow to traditional district schools, or reduce the autonomy of charter schools all contribute to reducing the impact a charter school can make. In a study of five urban

districts, Teske et al. (2000) attributed the modest effects of competition to several factors. The effects of charter school competition are lessened by financial cushioning and by a lack of school-level penalties for losing students to charter schools. Growing student populations may also reduce the competitive effects; even though traditional public schools are losing relative market share, the absolute number of their students remains constant. In districts where charter schools did have an impact, piecemeal rather than systemwide changes were made, mostly concerned with expanding the school day by offering new add-on programs. A study of Milwaukee and Cleveland by Frederick Hess (2003) found that public school districts were slowed in institutional reform but seemed ready to improve their marketing strategies in a competitive environment.

Charter schools also vary in the effects on income and social stratification, a concern widely shared by skeptics of school choice initiatives. Wong and Shen (2001), for example, found that California and Michigan have quite different charter school landscapes. Although each state has relatively strong charter legislation and a larger number of charter schools, the two states differ in terms of innovation and stratification effects. In California, for example, there is a clustering of high-achieving students by race. In Michigan, there seems to be less stratification. Other differences between the two states include the extensive involvement of higher education institutions in Michigan and the large number of home school-focused charter schools in California. These and other differences may account for the varying degree of stratification in the two states.

OUTSOURCING LOW-PERFORMING SCHOOLS

Nonprofit and for-profit organizations are expanding their presence in the public educational sector to compete for government contracts to run schools that are subject to state and district standards on accountability. Contracted schools are not necessarily charter schools. They enjoy school-site autonomy over personnel hiring, student recruitment, and staff compensation. Contracted schools, although they exercise a certain degree of management and programmatic discretion, are often governed by virtually all of the district and state guidelines, includ-

ing collective bargaining agreements between the district and the unions and academic standards and assessments that are applicable across the school district. However, the key feature is that the district or the state (i.e. the contract agency) is willing to grant management autonomy to the contracted service providers, which in turn agree to meet certain measurable outcomes within a given time frame.

In this governance arrangement, the contracted service providers are expected to “do the job better, or cheaper, with no fewer positive side effects and no more negative ones than the public alternative” (Donahue 1989, 221; also see Walberg and Bast 2001). In education, previous small-scale attempts to contract out low performing schools have produced mixed results (Orr 1999). While service providers seem to be able to raise student performance, they are less ready to address broader community concerns of school quality (Donahue 1989, 219). For example, school context and educators’ skepticism may pose a major challenge to any generic approach that is adopted by the Education Management Organizations (EMOs) (Hernandez and Mahoney 2002).

According to Arizona State University’s Education Policy Research Unit, there are over thirty major for-profit companies that manage almost four hundred traditionally public and public charter schools in dozens of states. Many of these for-profit companies that engage in a wide range of activities in elementary and secondary education have stocks that are publicly traded (Walsh 2002). Among these are Edison Schools Inc. (which is no longer publicly traded), Renaissance Learning, Inc., and Sylvan Learning Systems, Inc. In addition, many universities and community-based organizations are contracted to manage low-performing schools. For our analytical purpose, the role of the EMOs as contracted service providers in public, noncharter schools needs to be considered further.

In this regard, the most extensive effort to contract out persistently low-performing schools to alternative service providers is the Philadelphia school district. Edison Project was commissioned by former Governor Tom Ridge to conduct an assessment of the academic and financial position of the Philadelphia school district in the fall of 2001. The report’s findings provided the basis for the legislation that granted the governor appointive power of the ma-

jority of the school board. Edison project was subsequently hired as the “lead district advisor” to manage the central administration during March and July of 2002. An initial plan of granting Edison management over a substantial number of schools was terminated when the school board hired Paul Vallas, the former CEO in Chicago, to become the district’s CEO in July 2002. Instead, the Vallas administration selected seven outside managers (or EMOs) to manage forty-five low performing schools beginning in August 2002. EMOs, which included Edison Project (twenty schools), University of Pennsylvania, and Temple University, among others, were given extra financial incentives that ranged from \$450 to \$881 per student. In April 2003, the district terminated the contract with one of the EMOs, Chancellor Beacon Academies, for lack of progress. Thus, it remains to be seen if the EMOs in the Philadelphia experiment will raise student performance in the longer run (Paige 2004).

STATE-FUNDED VOUCHERS

Another prominent marketlike reform is the state-funded voucher experiments, which are implemented in Florida, Milwaukee, and Cleveland. These experiments signal that an unusual kind of political alliance has emerged to address the growing concerns with failing public schools in the inner city. This new alliance consists of two core segments of the Republican and Democratic Parties. Frustrated with the low quality of schooling opportunities for their constituencies, lawmakers and religious and community leaders in African American neighborhoods (a traditional core of the Democratic Party) have parted company with the teachers’ union (another Democratic core) and supported a more radical solution to the crisis in urban education. In the Republican Party, some governors and lawmakers have begun to engage in an effort to look for alternative strategies to improve failing schools in the urban neighborhoods. In Milwaukee, Polly Williams, a black state lawmaker, and Howard Fuller, a black activist and former superintendent, became the most outspoken supporters of the state-funded voucher program, which began in 1990. In Cleveland, Fannie Lewis, a Democratic member of the city council, spearheaded the 1994 passage of the choice program in the Ohio legislature. Joining the Democratic core were Republican

governors and their business allies who saw choice as a mechanism not only to improve school performance and market efficiency but also to weaken the influence of the teachers' union. In both Milwaukee and Cleveland, this unique alliance was gradually broadened to include the Catholic Church and a wide range of business interest groups. Seeing a broadening of support, key proponents of choice have attempted to increase the demand and supply of choice programs. For example, Milwaukee's Mayor John Norquist favored raising the income ceiling on eligibility. Pro-choice advocacy groups, such as the Heartland Institute in Chicago, continue to play an active role in organizing lobbying efforts in state capitals.

The Cleveland voucher program has gained national attention. The program started in the fall of 1996 and was immediately challenged by the court for violating the "establishment clause," as students were allowed to choose religious schools. The program was restricted to lower elementary grades during the initial phase. In its first year, about two-thirds of the nearly two thousand participants enrolled in kindergarten or first grade, and about 25 percent had attended private schools in previous years. The Cleveland program was challenged on the ground that over 90 percent of its students enroll in sectarian schools. In December 2000, the federal appeals court in Cincinnati ruled that the enrollment pattern had the "impermissible effect of promoting sectarian schools." However, in June 2002, the U.S. Supreme Court by a narrow margin of five to four found that the Cleveland voucher program did not violate the First Amendment's Establishment Clause that separates the affairs of religious institutions and the government. The New York Times headlines read, "Majority says Cleveland Program offers 'True Private Choice'" (Greenhouse 2002).

The Supreme Court's 2002 *Zelman v. Simmons-Harris* decision is likely to encourage some states to redefine the delivery of public education. First, the decision is likely to spread the voucher experiment to a growing number of states, just like the charter school movement over the last decade. Second, with state funding support, parental demand for school choice will grow. In response, diverse suppliers of schooling services will emerge. These include faith-based organizations, discontented parents and teachers, as well as nonprofit and community-based organizations. If the voucher movement grows as fast

as the charter school reform, the supply of public schooling in the next ten years will be significantly different than the existing service delivery system. However, the voucher movement, like the charter school reform, may also necessitate a more active state monitoring and support role (Fiske and Ladd 2000). As parents exercise school selection, the information needed for accountability and school performance will not subside.

PRIVATELY-FUNDED VOUCHERS

While the public has focused primarily on state-funded vouchers, privately funded vouchers have been implemented since the early 1990s. The first program was started by the CEO of the Golden Rule Insurance Company in Indianapolis that provided scholarship to 746 inner city children for schooling choices. By 1998/99, over 13,000 students used their private scholarship to attend schools of their choice in over thirty cities. These programs were shaped by the first Golden Rule initiative—private funds to provide scholarship to low income children on a first-come first-serve basis for whatever private or religious schools they select. In a review of the privately funded vouchers across the nation as of the late 1990s, T. Moe highlights the policy significance of this initiative. He points out, "But by comparison to the public programs, private voucher programs give us a much simpler, more direct indication of how choice and markets actually operate when the most burdensome trappings of bureaucracy and political control are removed" (2001b, 100).

The design of privately funded vouchers has changed from first-come first-serve to a lottery in recent years. This shift resulted from negotiation between the corporate funders of the programs and the Harvard-led research team that argued for a more scientific design in gathering data on program effects on student achievement. The study team was directed by Paul Peterson, whose early concerns about self-selection bias led him to compare voucher participants with those who applied but did not receive the voucher in the state-funded pilot programs in Milwaukee and Cleveland. It comes as no surprise that his argument for using scientifically based evaluation design has led to the use of random (lottery) selection of eligible applicants in the privately funded voucher programs.

In a study of several privately funded voucher programs for urban low-income children, Howell and Peterson found that African Americans benefited more from school choice than their peers. African American students who are program participants as a result of lottery in New York, Dayton, and Washington D.C., according to the authors, “gained, on average, roughly 3.9 [national percentile ranking] points after Year 1, 6.3 points after Year II, and 6.6 points after Year III” (2002, 146). These findings led them to offer a “differentiated theory of choice,” in that the program’s marginal benefits tend to be greater for those who encounter poor educational options (such as inner-city low income African American children). The benefits gap, as measured by statistically significant effect sizes, illuminates the consequences of shifting from public to private schools. While parental satisfaction was persistently strong in the voucher program, student departure from public schools showed “few adverse side effects” (p. 186).

A major part of this study lies in its application of the randomized field trials (RFTs). Although RFTs have been used in evaluation of intervention programs in health care, housing, and welfare assistance, they are rarely used in educational research. The Harvard research team collected baseline information (including student test performance) at the time of the application as well as follow-up information through the third program year. Lottery was used to randomly select voucher participants from the whole applicant pool. Those who were not selected became the control group for analytical purpose. The lottery fits the two essential criteria to aid in “an instrumental variable technique,” namely, that the lottery itself is a good predictor for students attending private schools and at the same time does not highly correlate with the outcomes (including student performance). Clearly, the RFTs offered a robust scientific base for the study’s internal validity.

Notwithstanding the potential of school vouchers to raise urban school performance, particularly among African American students, the proposed differentiated theory needs to take into consideration that vouchers by themselves may not be sufficient incentives to keep the participants in the private schools. While the initial parental demand seemed strong at the application stage, the attrition rates were fairly high during the first three program years (see

pp. 34–35). For example, in New York City, only 70 percent of those who received the voucher remained in the private schools toward the end of the third year. In Washington D.C., only 29 percent of the first-year cohort remained through the third year. Using these attrition rates for the three cities for the first cohort, I calculated that only about 54 percent of the students remained in private schools of their choice. What happened to the 46 percent who left would be an important research undertaking toward a more complete understanding of school choice. As Howell and Peterson briefly acknowledged (pp. 66–67), parental decisions not to use their vouchers were related to their inability to supplement their own income to pay for higher tuition, transportation cost, and the timing of getting the lottery results. In the Washington D.C. program, schools tended to select higher performing applicants in grades 6 to 8 (pp. 68–70). Peers, too, can dampen what may have been a positive experience when a student switched from public to private school. As Howell and Peterson found, vouchers had “only modest effects on peer friendships and racial integration” (p. 126). In other words, while the lottery is designed to ensure equal chances among applicants, individual schools enjoy autonomy over admissions and peers can exclude voucher participants from their social networks. At issue is the extent to which the fairness principle can be extended to the school sites, thereby bringing the supply side in closer alignment with the demand side.

Findings from the RFTs led Howell and Peterson to caution on direct causality between vouchers and achievement. They observed, “We are not able to explain the positive impacts of vouchers on African American test scores by any single factor . . . Education is too complex” (p. 187). Consequently, they questioned whether vouchers would be used effectively to fix failing schools given the difficulty of specifying causality between vouchers and test scores. They were equally concerned that vouchers that targeted only the low-income population would further isolate the disadvantaged from the rest of the community. Instead, they proposed a system wide strategy, distributing vouchers for all central city residents regardless of income, race, and ethnicity.

From the perspective of Howell and Peterson, vouchers for the entire city would be politically feasible without worsening income and racial stratification. This strategy, which takes into consideration

the interests of the city as a whole, is consistent with Peterson's argument in his book, *City Limits* (1981), where city governments are keen on implementing fiscal policy that enhances their competitive position but reducing their redistributive efforts. While vouchers that target low-income families would be seen as redistributive, citywide vouchers may have the potential of improving the overall schooling quality of education in the city, an example of human capital investment that would facilitate the city's long term growth. While conceptually appealing, citywide vouchers have yet to be carefully examined in terms of both intended and unintended consequences. Clearly, the use of scientifically based evaluation design will play a critical role in such a citywide experiment.

Howell and Peterson's policy recommendation clearly involves significant tradeoffs among societal and educational values. Kenneth Godwin and Frank Kemerer (2002) examine advantages and risks in school choice from a liberal democratic framework. Unlike Howell and Peterson, Godwin and Kemerer focused on both private and public school choice. During 1992 to 1996, the authors examined the privately funded Children's Educational Opportunity (CEO) program that offered scholarships to low income children in elementary grades in San Antonio. The CEO program was not a randomized experiment and did not exclude those families whose children were already enrolled in private schools. Instead, the 936 scholarships were allocated on a first-come first-serve basis. Further, Godwin and Kemerer studied the implementation of a district-funded accelerated, multilingual program that was based on academic performance of the sixth grader applicants. This popular citywide program rejected about 30 percent of the applicants.

Using survey data from participants in the two programs, the authors identified "choosers of private schools" (mainly the CEO program participants), "choosers of public schools" (mainly participants and other applicants who were rejected in the multilingual program), and "nonchoosers" (a random sample of public school students in the district who did not apply to any choice program). Unlike the Howell and Peterson study, Godwin and Kemerer did not examine those who applied but did not receive the privately funded CEO scholarship. Nor did they examine the CEO program participants who chose to

attend public schools outside of the neighborhood. Thus, the empirical base of their analysis did not fully utilize the available data from the two programs.

Several important findings emerged from Godwin and Kemerer's study of school choice in San Antonio. First, allocating scholarships using first-come first-serve tends to benefit students who are academically prepared and whose parents are more actively involved. To avoid self-selection, the authors suggested "a lottery system to choose among applicants, to exclude test scores from admissions criteria, and to have a quota of low-income students for each choice school" (p. 63). These findings are consistent with the argument made by Howell and Peterson. Second, in part due to self-selection, the schools that enroll choosers are generally supportive of teaching and learning. Third, Godwin and Kemerer did not find evidence to support a major concern of the school choice critics that selectivity would weaken students' support for democratic values and social tolerance. Finally, findings from the two programs showed that choosers with the most disadvantaged backgrounds tended to gain academically. In other words, the study confirmed "neither the nightmares of choice critics nor the dreams of choice proponents" (p. 64).

While Godwin and Kemerer did not take the methodological path that Howell and Peterson did in specifying the complex effects of school choice, they used their San Antonio study to illuminate the philosophical underpinnings of the school choice policy debate. Public contention over school choice, according to the authors, is ultimately tied to "the goals we want to pursue and that we assign a priority and a weight to each" (p. 65). Their synthesis of competing philosophical, constitutional, and economic perspectives provided the normative foundation on the aims of education in a liberal democracy (p. 234). The four major aims are: to provide students the skills to become economically independent, the political knowledge and skills to participate in democratic government, the moral reasoning to guide ethical behavior, and an equality of educational opportunity for all. These educational goals can be used to establish the standards in designing school choice policy, as suggested in their "proposal to expand school choice" (that begins on p. 235). More specifically, the state will expand its educational system to include nonpublic schools. It will identify 20 percent of its students as low income. Schools that admit students using state-funded scholarships/vouchers

are required to have at least 20 percent of their students from low-income families. Both private and public schools are exempt from the state's public sector collective bargaining law, except when a majority of the teachers in public schools decide otherwise. In incorporating these standards of choice and equity, the proposal takes a pragmatic approach. To some extent, Godwin and Kemerer's proposal resembles the school policy systems in the United Kingdom (see Wong 2001) and New Zealand (see Fiske and Ladd 2000) where choice is among several key policy levers to improve accountability and service quality. Unlike these systems, the Godwin and Kemerer proposal did not challenge the tradition of state control by calling for a national graduation examination system for the purpose of accountability (also see Moe 2001a).

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MULTIPLE STRATEGIES TO IMPROVE ACCOUNTABILITY

More than two decades ago, the National Commission on Excellence in Education issued its recommendations on reforming the nation's schools. In *A Nation at Risk* (1983), the Commission argues that the nation's interest lies in higher academic standards in our public schools and institutions of higher education. Although the commission was appointed by the Ronald Reagan administration, it did not advocate the agenda of the Reagan White House to dismantle the U.S. Department of Education and to enact tuition tax credit. Nor was the commission sympathetic with the Democratic-controlled Congress's recommendation for an increase in educational spending. Instead, the commission took a broader view on the nation's path toward "creating a learning society" (p. 13). More specifically, the commission recommended strengthening the core content areas, developing rigorous standards with high expectations for all students, improving the effective use of instructional time, requiring quality teachers in the classroom, and making comparisons of standardized tests of achievement.

Typical of the work of a broad-based commission,

A Nation at Risk was less specific in suggesting an accountability system to make certain that its recommendations would be implemented. In their analysis of the report, the Koret Task Force on K-12 Education at the Hoover Institution states, "[The Commission] seemed not to realize that the system lacked meaningful accountability and tangible incentives to improve, that it exhibited the characteristic flaws of a command-and-control enterprise" (Koret Task Force 2003, 11). Although the commission neglected to propose a system of accountability to ensure reform implementation, subsequent federal, state, and local actions have moved toward developing their systems of accountability that seem to facilitate the realization of the key programmatic recommendations of the 1983 commission. In short, more than two decades following the Commission's work, the nation is now ready to use multiple strategies to improve accountability in its public schools.

Building on the 1994 *Improving America's Schools Act*, the *No Child Left Behind Act of 2001* (NCLB) has its primary focus on the academic achievement of all students, particularly low-performing students in disadvantaged Title I schools. The 2001 act mandates states to establish and implement an accountability plan with well-defined standards for academic proficiency. It also requires states to hire highly qualified teachers who are trained in their instructional subject areas. Students are required to take annual tests in grades three through eight with results disaggregated by several subgroups, including racial and ethnic groups, special education students, and English language learners. Additionally, NCLB allows for supplemental services and school transfers for students in schools identified as low performing.

Even prior to the congressional enactment of the NCLB, many states had already established accountability plans and several states were ready to take more direct intervention in low-performing districts and schools. This state-led accountability movement is likely to grow rapidly as the federal NCLB requires a stronger state role in raising student performance. The law specifically requires states to administer annual assessments in reading and mathematics and to measure "adequate yearly progress" of all students and all schools, including special education populations and those who are English language learners. The federal law also sharpens its focus on narrowing the achievement gap among racial groups.

Governmental efforts toward strong accountability have received increasing public support, according to a parent survey conducted by Public Agenda. (Public Agenda 2000). The survey focused on parental reaction to standardized tests and stronger academic standards, gathering responses from parents nationwide. They also gathered sample information in several large cities, including Boston, Chicago, Cleveland, Los Angeles, and New York. Parent responses indicate that there is a strong relationship between accountability (in the form of content standards and standardized tests) and parental perception of the school district.

In the survey parents were asked: "Requiring schools to publicize their standardized test scores is a wakeup call and a good way to hold schools accountable. Do you agree or disagree?" Parents could choose from four options: strongly agree, somewhat agree, somewhat disagree, or strong disagree. In Boston, Chicago, and Cleveland, three cities where the mayor has taken control over the school district, parents overwhelmingly agreed that test scores are a good way to hold schools accountable. In Boston, 80 percent of parents agreed (with 57 percent strongly agreeing); in Chicago, 78 percent agreed (with 52 percent strongly agreeing); and in Cleve-

land, 76 percent agreed (with 56 percent strongly agreeing). All three cities had a greater percentage of parents strongly agreeing with the question than the national average of 49 percent. The Public Agenda survey thus suggests an overall climate supportive of accountability-based reform, which may include multiple sets of measures on student learning.

A policy convergence toward accountability notwithstanding, this chapter argues that there are competing approaches to improving school quality and raising student performance. From a broad societal perspective, socially oriented programs are needed to manage the tension between equity and efficiency. From a governance view, innovative practices are likely to continue to soften the jurisdictional boundary between an independent school district and the market, as well as between the schools and the mayor's office. From a classroom perspective, reforms must closely connect to the reality of teaching and learning. In other words, as accountability gains prominence in the nation's school-reform agenda, so will the debate on the most effective strategies to reach the goal of high student performance.

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SOCIOLOGY OF EDUCATION

Sociology of education is a specialized area of study within the discipline of sociology that addresses a range of social aspects of educational activities, processes, and institutions. The sociological study of education is generally viewed as originating with the work of Emile Durkheim, a major figure in sociology in general, who held the first university chair in pedagogy beginning in 1887. Among other things, Durkheim (1961) argued that education is the institution through which the moral values of the adult generation are transmitted to the young. Education serves both to maintain societal arrangements and to change them. Educational institutions constitute a major societal sector, and they have engendered careful examination by all those seeking to understand how societies organize socialization experiences for youth. Because educational systems are the result of intentional policies, the educational sector has also been a focus of inquiry for those who wish to use education as an instrument for social action of one kind or another. These dual purposes, understanding the social aspects of education and employing education to achieve social goals, motivate the work in the sociology of education.

The central role of education in all modern societies makes it an obvious target of inquiry for all those who would attempt to understand how societies function and develop. Over the years sociologists of education have engaged in a wide range of theoretical and empirical work concerned with understanding the role of education in societies as well as the inherently social nature of education organizations and processes. Such work has asked major questions about the role of educational institutions in societies, including how broader societal features influence the shape of an educational system, how education interacts with other major social institutions such as the family and the state, how the educational system operates to enhance or impede social

mobility, how the educational system contributes to economic prosperity, and how education can foster democracy in nations.

Sociologists of education and more policy-oriented scholars and practitioners have also employed sociological perspectives to determine ways in which the educational institutions and processes might be employed to achieve social goals. Such goals have included unifying a people in support of a nation and its values, creating a sense of order and acceptable behavior, preparing individuals for the modern workplace, shaping values, and changing behavior.

MULTIPLE LEVELS OF STUDY

Sociologists of education have engaged in study and analysis at multiple levels. Macro-level studies have examined the history, development, and nature of systems of educational activities and institutions in diverse societies. For example, Margaret Archer (1979) offers an historical and comparative analysis of how the major features of educational systems are shaped over time. John Meyer, David Tyack, Joane Nagel, and Audri Gordon (1979) consider the role of nation-building social movements in shaping the development of public education in the United States. Sociologists of education have also examined deliberate efforts to reshape educational systems through policies to promote school choice (Fuller, Elmore, and Orfield 1996), regulations pertaining to testing of students (McNeil 2000; Orfield and Kornhaber 2001), and longstanding strategies to improve urban education (Anyon 1997).

Mid-level analyses have focused on schools as the organizations where formal educational processes take place in modern societies. For instance, Willard Waller (1932/1965) examines the internal operation of schools, including the student culture and the efforts of teachers to maintain control.

James Coleman (1961) analyzes the lives of adolescents in secondary schools. Charles Bidwell (1965, 1987) offers a framework for the study of schools as formal organizations. John Meyer and Brian Rowan (1983) and Robert Herriott and William Firestone (1984) consider the internal connections between elements within schools. Various efforts to reform schools have been studied by sociologists, including school restructuring (Lee and Smith 1993) and comprehensive school reform (Legters et al. 2002).

Micro-level studies have been conducted in classrooms and other face-to-face educational settings. These studies have examined patterns of social interaction among the different actors in the educational process, including students, teachers, counselors, specialized educational personnel, administrators, and parents. For example, Talcott Parsons (1959) highlights the benefits of viewing the school class as a social system. Robert Dreeben (1968) discusses the ways in which the very structure of classrooms, schools, and relations between teachers and students creates fundamental socialization experiences to prepare students for modern society. Stephen Bossert (1979) notes how the structure of tasks in classrooms contributes to social order. Steven Plank (2000) examines the ways in which interactions among student peers are shaped by differences in status characteristics such as race and how those interactions can be further directed by the leadership styles of teachers and the structure of tasks and rewards. Susan Stodolsky (1988) considers the impact of the school curriculum on relations in the classroom. Maureen Hallinan and Aage Sorensen (1983) examine the factors leading to the formation of ability groups within classrooms. Sociologists have also developed and studied strategies for improving conditions for learning in classrooms. For instance, Elizabeth Cohen (1994) specifies the conditions that will make group work a more effective learning opportunity for students.

PLAN OF ENTRIES

The remaining entries in this chapter highlight work at each of the levels of analysis—macro, middle range, and micro—followed by a review of recent work by sociologists of education to contribute to efforts to reform and improve schools. A discussion of educa-

tional systems considers work at the broadest level of the relationship of education systems to the nations in which they operate. Education is treated as a sector comparable to other major sectors in modern societies such as religion, the economy, and the political system. Consideration of work in the middle range focuses on studies of schools as the major educational institution. Much of this work views schools as formal organizations and applies frameworks and concepts drawn from organizational analysis. Studies of the face-to-face interactions of teachers and students in classrooms demonstrate the use of micro-level analyses. These studies examine how social processes within classrooms enhance or impede learning opportunities for students. Finally, research in the sociology of education that bears directly and indirectly on efforts to change schools is considered as part of the school reform movement of the past twenty years. This work draws on sociological theories and concepts and attempts to offer concrete suggestions for school improvement.

Gary Natriello

SOCIOLOGY OF EDUCATIONAL SYSTEMS

Macro-level analyses of the social dimensions of educational processes and systems have constituted a great deal of the work of sociologists of education over the years. These analyses consider education as part of the broader social order and the place of the educational sector alongside other major social domains such as religion, culture, and politics. For the most part, the focus is on entire systems of education as opposed to particular schools, programs, educators, or classrooms.

Sociologists of education have examined educational systems in modern societies from a number of perspectives. Most of the approaches to the study of education at the societal or macro level can be related to either a functionalist or conflict orientation to society and its major institutions. Each of these orientations causes theorists and investigators to focus on different aspects of educational phenomena.

Functionalist explanations (Durkheim 1956, 1961;

Parsons 1951) focus on the social integration that is essential to the development and maintenance of nation states. Thus functionalist approaches tend to stress the need to move toward social consensus regarding fundamental values. From this perspective, education is viewed as a key institution in motivating and socializing individuals to behave in ways consistent with dominant societal values as part of a broader effort to maintain the societal order and cohesion. It is to education that the task of inculcating basic societal expectations falls. In the United States and other democracies, of course, participation in the democratic process is a key social value or common expectation that is conveyed (Giroux 1989; Gutmann 1987), but other values include order (Spady 1974), and sufficient skills acquisition to participate in the economy.

Human capital approaches (Becker 1993) to the role of education in society are a particular variant of the functionalist perspective that emphasizes the economic dimensions of education's contribution to the greater social good. Human capital theory argues that education is a worthy investment not only for an individual who will see his or her life prospects improved by acquiring more education but also for the society overall that will realize greater economic growth and development as a result of investments in the educational sector. The human capital approach is apparent in studies of the effects of education on the subsequent positions of individuals in the job market (Blau and Duncan 1967), as well as in broader studies that attempt to relate a society's investment in education to its subsequent economic development (Leach and Little 1999).

In contrast to the individualistic orientation of human capital approaches to education, social capital (Coleman 1988) and cultural capital (Bourdieu 1977) perspectives call attention to the social or group dimensions and consider how such resources advantage members of certain groups in societies. Social capital considers the role of relations in networks and communities and treats such relations as a resource that can aid or impede the schooling process. When students are imbedded in social networks with obligations and expectations, information channels, and social norms supportive of schooling, they are more likely to succeed in school. When students are not connected in this way to such resources they are less likely to succeed (Coleman 1988). Cultural capi-

tal focuses attention on the ways in which students utilize things such as knowledge of the arts, literature, and major intellectual trends along with appropriate language to gain advantage in school and later in adult life (Bourdieu 1977; Bourdieu and Passeron 1977).

In contrast to the functionalist perspective, the conflict perspective on the relationship between school and society argues that the expansion of systems of education within societies is not driven by the social or technical needs of the society to achieve unity and economic development but, rather, by the competition among wage groups that seeks to achieve relative advantage through education. Conflict theorists (Collins 1978; Bowles and Gintis 1976, 2002) maintain that the main activity of schools is to convey particular status cultures. Education is believed to reinforce status cultures by identifying insiders and posing barriers to outsiders.

The conflict perspective provides a particular analysis of the relationship between the economic system and the educational system. Samuel Bowles and Herbert Gintis (1976) have argued that there is a correspondence between the social relations of the workplace and the social relations within the educational sector. This correspondence suggests that the requirements of the modern economy for a division of labor and the segmenting of individuals into a worker class and a management class lead to similar arrangements within schools so that the necessary workers and managers emerge from the educational system to meet the needs of the economic system. Moreover, the organization of the educational system in ways that mirror the organization of the economic system means that individuals are socialized with the appropriate values and dispositions.

EDUCATION AND NATION BUILDING

Sociologists have considered the role of education in nation building, that is, in creating the modern participatory nation state. Theorists (Meyer, Ramirez, and Soysal 1992) have noted that in the modern world a primary function of schooling is to create citizens of nation states, that is, to convey to individual students that they are in fact citizens. Citizenship connotes a direct link between individuals and the state. Moreover, citizenship is universal within the state as all individuals come to be viewed as citi-

zens with certain rights and responsibilities. Modern states do not simply organize relations among people in ethnic groups, regions, or other collectives; they act to turn each individual into a citizen with standing independent of other characteristics.

With citizenship as the fundamental building block of the relation between individuals and the modern state, the state finds it necessary to convey a sense of common history to all of its citizens, that is, it must provide all citizens with the feeling that they are all really alike. This relationship is used to explain how it is that modern nation states all come to have formal systems of education.

The role of education in creating citizens and, indeed, modern nations, is illustrated by Bernard Bailyn's (1963) analysis of the development of the educational system in the United States. He begins his analysis by considering how the culture was transmitted in the colonial era prior to the development of the system of education. He identifies three agencies as involved in such cultural transmission: the family, the community, and church. The family provided elementary socialization as well as initial vocational training. The community provided additional instruction in the appropriate behavior in society and in the workplace with an emphasis on discipline. The community also introduced youth to the role of the local government and the state. The church offered additional exposure to the morals of the community and exposure to a system of thought and imagery that was the basis for the values of the culture. In addition, the church offered the most meaningful sanctions to reinforce behavioral norms.

Each of these socializing institutions was disrupted during the colonial period. The instructional functions of the family were rendered somewhat obsolete by the migration to the new world where children often had knowledge equal to or greater than parents. The impact of the community was diminished as small towns gave way to larger urban centers where children no longer had the sense that they were imbedded in a web of family and community relations that provided coherent and consistent guidance. The power of the church to instruct and influence was diminished as a result of growing religious pluralism.

In response to waning influences of families, communities, and the church, the American nation turned to the development of an educational system with a mission to bring about a homogeneous citizenry in

response to forces that promoted an increasingly heterogeneous society. Education became the centerpiece of efforts to self-consciously and deliberately forge a common conception of citizenship. Education was subsequently employed to include within the nation individuals from diverse groups (e.g., Native Americans, immigrants), although the nature and the extent of the inclusion were often such as to maintain the advantage of those already in power.

Creating citizens remains a fundamental purpose of education in the current era. Stable modern states achieve stability through expanding democratic participation and through reinforcing the mechanisms of state control. More contemporary investigations of the impact of formal education on the political development of nation states indicate that populations with higher levels of education are more likely to have higher levels of democratic participation (e.g., see Lipset 1959; Almond and Verba 1965) as well as a greater sense of national solidarity and purpose and a greater sense of the legitimacy of the leaders of the state and elites in general. Francisco Ramirez and Richard Robinson (1979) found some evidence for the impact on democratic participation as well as some slight evidence that education does lead to higher levels of public bureaucracy and the control that accompanies it. The dual effects of increasing participation and increasing solidarity and state control are assumed to allow states to avoid instability as they develop.

Investigations of the impact of education on individual values and attitudes illustrate some of the ways that education enhances modern nation states. Studies of the impact of college on intellectual and aesthetic values and interests (e.g., Hyman and Wright 1979) show that higher levels of education are associated with higher levels of knowledge, a more intellectual outlook and greater receptivity to additional knowledge in the areas of current affairs, domestic and foreign policy, health, and popular culture. Studies have also shown that increased levels of education are associated with perceiving the importance and value of a good education (Knox, Lindsay, and Kolb 1992) and that attending college has a positive impact on things such as altruism, humanitarianism, and valuing civic activities (Astin 1977). Attending college does seem to have effects on political attitudes with education level positively related to being informed about public affairs and presidential elections (Hyman and

Wright 1979) and even to a general interest in politics, political activism, and holding public office (Knox, Lindsay, and Kolb 1992). Herbert Hyman and Charles Wright (1979) found that years of education were positively related to support for civil liberties, for freedom of information, due process of law, public expression, for freedom from legal constraints on intermarriage, for privacy, and for equality of opportunity for minority groups.

EDUCATION AND STRATIFICATION

In addition to creating a sense of common purpose and identity among individuals in modern nation states, education is also seen to reflect and contribute to social stratification within societies. That is, education plays a role in the differentiation of individuals and groups of individuals and the attaching of value to different social statuses.

Two general questions have been addressed regarding the role of education in social stratification in modern societies. First, what are the social background factors that determine how much education an individual is likely to get and the nature of that education? Second, what factors determine an individual's adult status, and, in particular, what part does education play in determining that status?

Sociologists have long examined educational attainment and its association with various social factors. The attainment process can be examined at the elementary level, the secondary level, and the post-secondary level. At the elementary level several social factors are related to whether or not an individual enters elementary school. Not surprisingly, the nation state makes a difference with virtually everyone entering school in some nations and a more variation in others, though over time elementary schooling has been extended more broadly. Social class differences have an impact on likelihood of entry where entry is not universal with children of more educated parents and those of parents with higher status occupations more likely to begin school. Where there are gender differences, males have an advantage over females. Geography plays a role in ways often related to social status with individuals in areas inhabited by higher status individuals (e.g., urban areas, more central areas, more central ethnic areas) more likely to enter school. Once in elementary school, ability has an impact on performance

with socioeconomic status having a smaller impact.

At the secondary level entrance is influenced by the nation state, and there are advantages for urban students and those from higher-status families. The effects of ethnicity and gender vary from country to country. Earlier school performance (e.g., grades) and measured intelligence make a difference in those countries where there is a formal system of examinations. In systems where there is variation in the secondary school program students from higher socioeconomic status backgrounds, those with better grades and higher measured intelligence tend to receive more valued programs (i.e., programs designed to lead to higher status adult occupations.) Performance in secondary school is related to prior school performance and measured intelligence with socioeconomic status and ethnicity having smaller effects. Secondary school completion varies by country with grades having an effect as well as socioeconomic status and ethnicity. The secondary school curriculum has an effect with students in college preparatory curricula more likely to complete secondary school.

Entrance to post-secondary education varies by country with some countries having much higher proportions of students entering college. Prior grades and measured intelligence have an impact on post-secondary entrance that is greater when there is a testing system in operation. Parents' educational levels have an effect along with parents' occupational status. College entrance is also influenced by the type of secondary school attended, the secondary school curriculum, and the aspirations of secondary school peers.

Examinations of the role of education in determining adult occupational status suggest that the process of status transmission from one generation to the next occurs primarily through education in modern societies. Individuals with greater educational attainment enjoy advantages in terms of adult occupational status. The number of years of schooling has a substantial effect on one's adult occupation. Of course, family social background has an effect on educational attainment so the effects of that background are largely transmitted through the educational system (Blau and Duncan 1967; Sewell, Hauser, and Featherman 1976).

The mechanism by which educational attainment affects adult occupational status has been interpreted from several perspectives (Collins 1971). A technical perspective suggests that individuals with greater edu-

cational attainment have more well-developed skills that are needed in certain occupations. Thus individuals with greater educational attainment are hired into higher status, more demanding positions in the adult occupational system. An alternative credentialing perspective argues that educational credentials are used to control entry into certain careers and career paths and that the positions in these careers are less reliant upon the skills of individuals and more rooted in the cultural characteristics that are associated with educational experiences and social background. From this perspective, educational credentials are more reasonably interpreted as signifiers of cultural characteristics than they are of technical skills. In this view employers are thought to be more concerned with dispositions associated with cultural background than with specific technical skills.

SUMMARIZING THE EFFECTS OF EDUCATION AS AN INSTITUTION

John Meyer (1977) has argued that the effects of education as an institution on societies can be understood from three major models or perspectives. He refers to these as socialization, allocation, and legitimation and suggests that all help explain the role of education in society. The traditional socialization perspective suggests that the educational system provides experiences to individuals that instill knowledge, skills, and attitudes. These individuals then have an expanded and more well developed set of personal qualities, which in turn allow them to demand more from and achieve more in the role structure of modern societies. As the competence of individuals in a society is enhanced, the overall society itself is enhanced and progress is achieved.

Allocation theories developed in response to a degree of social progress that is less than might be anticipated if the socialization model was all that was operating. The allocation perspective assumes that individuals in modern societies are allocated to adult roles in society on the basis of years and types of education independent of anything that they might have learned in schools. From this perspective, education operates more as a sorter or selector than as a socializer. From the allocation perspective, education is less concerned with instruction or socialization than it is with the set of institutional rules that classify and authoritatively allocate individuals to positions within a

society. Meyer (1977) specifies several additional effects or dimensions of the allocation perspective. At the school level educational allocation rules provide schools with social charters to define their students as graduates possessing distinctive rights and capacities in society. At the individual level, students tend to adopt personal and social qualities appropriate to the positions to which their schools are chartered to assign them. In addition, adults tend to adopt qualities appropriate to the roles and expectations associated with their adult statuses.

Legitimation theories deal not only with the movement of individuals into certain established positions within society, the phenomenon explained by allocation theories; they also deal with the impact of education on the arrangement of the positions themselves. That is, legitimation theories offer an explanation of the role of education in determining the social structure of societies. According to Meyer (1977) legitimation theories explain how modern systems of education operate to create certain rules that we all take for granted, rules governing the organization of personnel and knowledge in a society. According to the legitimation perspective, education provides a legitimating theory of knowledge by defining certain types of knowledge as authoritative or more valuable than other types. Education also provides a legitimating theory of personnel by defining categories of individuals who are assumed to possess certain bodies of knowledge and the accompanying authority. Both mass education and elite education operate in these ways. Mass education distributes general knowledge broadly and fosters the creation of citizenship or membership in the state. Elite education distributes specialized knowledge to limited categories of individuals and fosters the certification of expert authoritative competence.

Gary Natriello

SOCIOLOGY OF SCHOOLS

Investigations of the organization and operation of schools have dominated mid-level sociological studies in education. Since formal systems of schooling now exist around the world, the attention to the school as an important unit of analysis is not sur-

prising. This focus has allowed sociologists of education both to study these formal organizational contexts in which education now takes place within modern societies and to offer policy-relevant guidance to those charged with the development of educational systems. The diverse nature of studies of schools makes it challenging to classify work done at this level by sociologists. For the present purposes sociological work at the school level will be organized in three major categories concerning schools and the creation of members, the role of schools in the stratification process, and the insights of sociologists of education regarding the organizational structure of schools.

SCHOOLS AND THE CREATION OF MEMBERS

Schools have an initial task of taking in individual students and conveying to them a sense of membership in the school community, and, indeed, the larger society. Charles Bidwell (1965, 1970) and Robert Dreeben (1968) have observed that the student role in formal schooling is a recruitment role in which students are forced to attend simply because of their age. Dreeben explains how the structuring of the schooling experience prepares students to adopt the norms that are necessary to function effectively in modern societies. Schools engage in various processes and rituals to instill student commitment in the face of this process of forced affiliation. Anthony Bryk and Mary Driscoll (1988) observe that there are common activities within schools that serve to promote a sense of community and lead to enhanced commitment from students. These include rituals and ceremonies that involve students in celebrations, common academic experiences such as courses or tests, and special activities beyond the academic curriculum.

Rituals and ceremonies convey a sense of common membership in the school. For example, two such activities found in some schools are opening ceremonies to mark the beginning of a school term and initiation ceremonies or rites of passage to mark the beginning of membership in the school community for individual students. The opening ceremonies may, for example, serve to reiterate the school's mission and the need for all to participate in the pursuit of that mission (Kapferer 1981). Initiation ceremonies may involve the systematic humiliation of

new members to separate them from their former statuses and leave them ready to accept new identities as members of the school. Such common experiences may also increase solidarity among new members (Weinberg 1967).

Other ceremonies may occur throughout the school year. Nancy Lesko (1988) describes the homecoming ceremony at a Catholic high school as a series of events that promoted the total involvement of students, and Jacquetta Burnett (1969) describes the homecoming as a systemwide rite of intensification that provided an opportunity for equal participation and membership in the school. Culmination ceremonies such as graduation and associated events also enhance the commitment of students to their schools. In addition to major ceremonies, there are a variety of other elements such as school mascots, school rings, school songs, and school uniforms that reinforce a sense of belonging and membership among students. Velma LaPoint, Lillian Holloman, and Sylvan Alleyne (1993) observe that school uniforms reinforce a sense of "oneness" among students and operate to identify the members of the school.

A common core of academic experiences may also play an important part in promoting student membership and commitment. Bryk and Driscoll (1988) note that a curriculum common to all students has symbolic value in that it provides students with common experiences and binds them to their peers as well as to those coming before them and those following them in the school. Anthony Bryk, Valerie Lee, and Peter Holland (1993) claim that the common core of academic experiences found in Catholic high schools serves to bind students together. Becky Smerdon (2002) finds that students in the academic track and those taking more math and English courses experienced greater feelings of membership than other students.

The development of student membership also depends on patterns of communication, interaction, and cooperation. Gary Wehlage et al. (1989) identify four aspects of interaction in schools that contribute to memberships: (1) efforts to create positive relations between adults and students; (2) concern for individuals and their personal problems; (3) assistance in meeting school standards; and (4) help in identifying a student's future in the wider society. These factors lead to positive student social behavior and engagement with the academic program.

Shared values may also contribute to promoting student membership and commitment. Bryk and Driscoll (1988) observe that shared values may include both norms for instruction pertaining to teaching and learning as well as norms for civility pertaining to relations among individuals in the school. The values related to instruction may involve the purposes of the institution and the activities it undertakes to achieve those purposes. For example, Miachael Rutter et al. (1979) found that schools with a more salient academic emphasis as evidenced by the assignment of homework and high teacher expectations had better attendance and fewer social and academic problems among students. Values related to social relations can also be linked to the core mission of the institution. For example, Lesko (1988) found that the atmosphere of caring that pervaded St. Anne's High School was rooted in the Christian commitment to community and included the norms of offering assistance to others and a prohibition against exploiting others.

THE ROLE OF SCHOOLS IN THE STRATIFICATION PROCESS

In addition to structures and processes that foster a common sense of membership and commitment, schools are also structured and operate to differentiate among students along certain lines. At times this differentiation is nondeliberate or at least not formally intended; at other times the differentiating elements of schools are quite deliberate. Sociologists have examined both the nondeliberate differentiating processes as well as those that are intended. Among the former, particular attention has been devoted to differentiation of students in terms of race, gender, and social class. Among the deliberate forms of differentiation there have been examinations of curriculum, special programs, and special schools.

Studies of the impact of student race and ethnicity in schools have examined the behavior of teachers as well as the social relations among students. Studies of desegregated schools have examined both patterns of teacher behavior (Schofield 1989) and patterns of interaction among students (Patchen 1982). The results of studies such as these suggest that the influences of racial and ethnic status are serious and complex. Investigations have revealed that the patterns of interaction between teachers and stu-

dents and among students lead to different degrees of access to the resources of schooling for students from different ethnic groups. Specifically, Black and Hispanic students receive less access to the resources necessary to succeed in school than nonminority youth (Natriello and Dornbusch 1984). Racial and ethnic minority students, when subjected to differential treatment, are less committed to the goals of the school.

Gender is another basis for the differentiation of experiences in school. The consensus is that boys seem to enjoy advantages in mathematics while girls have an advantage in reading (Brophy 1985; Fennema and Peterson 1985, Fennema and Leder 1990). These differences in school experiences appear to be related to differences in cognitive and behavioral patterns developed prior to entering school (Houston and Carpenter 1985).

A variety of investigations over decades have documented the schooling experiences of students from different social class backgrounds. For example, Eleanor Leacock's (1969) study of urban schools revealed that teachers assumed that lower-class students could not meet the standards set for middle-class students and so lowered their expectations for student performance and their levels of attention to student achievement. Annette Lareau (1989) has explained how schools fail to draw on the strengths of working class families. Both Paul Willis (1977) and Jay MacLeod (1987) have documented how lower class student groups in secondary schools develop norms in opposition to the goals of the schools.

In addition to studying the ways in which schools deal with characteristics such as race, gender, and social class as differentiating factors that they have no role in creating, sociologists of education have also examined the deliberate policies and practices of schools that play an active role in differentiating and stratifying students. Among these practices are curriculum tracking, special education, and schools with special purposes and identities.

The school practice of tracking, that is, dividing students into separate classes along presumed ability lines, has long been a subject of interest to scholars. Various studies have examined the evolution of tracking practices (Oakes 1985; Lucas 1999), the differential access to knowledge offered to students in different tracks (Oakes, Gamoran, and Page 1992), the processes by which students are assigned

to tracks (Gamoran 1992), and the amount of mobility of students among tracks (Riehl, Pallas, and Natriello 1999).

The differentiation of the school program entails differences in both the content of the curriculum and the pace with which students move through it. Students in higher tracks move at a faster pace, have access to more knowledge, particularly in certain areas such as science and mathematics (Vanfossen, Jones, and Spade 1987), and are exposed to more higher-order thinking than those in the lower tracks (Oakes, Gamoran, and Page 1992). Gamoran and Berends (1987) cite a range of ethnographic studies which together suggest that teachers in lower tracks reduce both the pace and complexity of instruction and that such differences are reinforced by the assignment of more experienced and more successful teachers to the higher tracks.

Other studies have examined the effects of race and ethnicity on track placement. Adam Gamoran and Robert Mare (1989) find that black students are overrepresented in the lower tracks, but that this pattern is attributable to black students' disadvantages on other factors. When black students match white students on prior achievement and other background and school factors, they are substantially more likely to be placed in the college prep track than white students. Oakes (1990) finds that black students are more likely to be overrepresented in low-ability science classes than in high-ability science classes.

The concern about the distribution of students in different social groups among the various level tracks is connected both to the segregating effects of tracking and to the disadvantages that might accrue to those in the lower tracks. To the extent that track placement is related to student characteristics such as social class, race and ethnicity, and gender, it would tend to reinforce existing differentiating processes in schools. In the process of differentiating students to attempt to serve them more effectively, those students from traditionally disadvantaged groups may be further disadvantaged.

If tracking and ability grouping differentiate students in terms of where they fall on a continuum of ability, disability grouping differentiates students by designating them as being off of that continuum. Such grouping of students by disability has taken three principal forms in U.S. schools: compensatory education, special education, and bilingual education.

Each of these forms of disability grouping has created separate educational experiences for students within schools. Each is based on a different rationale and understanding of the needs of the students involved. Compensatory education emphasizes the social origins of educational difficulties experienced by children (Leinhardt and Bickel 1989); special education is rooted in material processes of the human body and mind or in neuropathology that lead to learning problems (Carrier 1986); and bilingual education derives from assumptions about the needs of students who are learning a new language of instruction along with other learning challenges.

Compensatory education, special education, and bilingual education have all been organized by dividing the students deemed in need of special services from other students in the school, though each has also been offered in more integrated delivery modes. The segregating effects of these programs of instruction has led to questions about the processes used to select students for such services (Mehan, Hertweck, and Meihls 1986), the same kinds of questions associated with the assignment of students to tracks or ability groups. The social bases for such identification and selection processes have been examined (Barona and Faykus 1992) to determine whether nonrelevant social characteristics lead certain students to be labeled and not others, independent of real learning needs.

The social segregation associated with these disability groupings is viewed as leading to undesirable outcomes for students. Students in integrated settings are found to make more progress in terms of social competence than those in segregated settings (Cole and Meyer 1991). Nancy Madden and Robert Slavin (1983) conclude that regular class placement with adequate supports produces results superior to those from full-time restrictive settings in terms of student self-concept, classroom behavior, and attitudes toward school.

Students may also be divided into groups in schools according to their interests. Such divisions include special theme schools such as those included in magnet school programs as well as special theme programs within schools. Student self-affiliation with special interest schools and programs can be associated with greater student commitment and, indeed, self-affiliation is often a part of the process by which students are divided into groups according to their

expressed interests. However, the positive outcomes associated with self-affiliation tell us little about the overall effects of dividing students along interest lines because such divisions almost inevitably result in some students having to compromise their interests and others never having their interests invoked as the schools involved employ some selection process of their own.

UNDERSTANDING SCHOOL STRUCTURE

Sociologists of education have made important contributions to analyses of school structure. Rational models of organizational structure that emphasize the bureaucratic nature of schools (e.g., Anderson 1982) are enriched by analyses that included more attention to the social dimensions of schools (Bidwell 1965) and the limited technical core or technology available to educators as they try to accomplish their work. Daniel Lortie (1969) identifies the incomplete or mixed nature of the school authority system that treats teachers sometimes as professionals with autonomy, and at other times as workers who must take direction.

When investigations seeking the connections that hold schools and key personnel together failed to find much in the way of substantive ties among those in various school roles, sociologists of education developed alternate models to explain structure. These models argue that the internal connections among major actors within schools were rather loose (Weick 1976, 1981), and suggest looking to the external environments of schools as sources of their cohesion. These environmental approaches suggest that schools are structured by the expectations held for them by those in their external environments (Meyer and Rowan 1977, 1983). From this perspective schools are viewed as institutionalized organizations, organizations for which there are clear and agreed upon understandings held by those outside of the immediate organization, that serve to organize internal operations. The development of these multiple perspectives on school organization and operations has led to a somewhat blended model to explain the operations of schools, with some placing more emphasis on the internal bureaucratic connections among elements of the school (Herriott and Firestone 1984) and others focusing more attention

on the external environments of schools as an important organizing force (Meyer and Rowan 1983).

Gary Natriello

SOCIOLOGY OF CLASSROOMS

Sociological work at the micro level has focused primarily on interaction among teachers and students in classrooms. This work begins with the assumption that the classroom group may be considered a small social system with some of the same processes and structures found in larger systems (Cohen 1972). Sociological work in classroom settings has examined the full range of interaction. Three themes capture much of the work of sociologists concerned with life in classrooms: processes that promote fostering commitment and order, processes that serve to differentiate students from one another, and the sociology of knowledge as a perspective on the curriculum that defines the substance of work in classrooms.

FOSTERING COMMITMENT AND ORDER

Talcott Parsons (1959) observes that students in classrooms are socialized to develop commitments necessary for their future roles in society and that these commitments involve both acceptance of broad social values and acceptance of the need to perform a specific type of role within the structure of society. Parsons talks about much of the initial socialization work being accomplished within the elementary school classroom early in the educational careers of students. Organizing classes so that students are assigned to a single teacher for a year at a time is a key part of setting the conditions for socialization. Charles Bidwell (1965) notes that commitment to the student role is largely the result of a close, warm relationship between the student and the teacher. The arrangement of elementary classrooms provides the structure within which such a relationship can develop. In addition to the personal relationship with the teacher, elementary classrooms can have various rituals connected with them that can enhance the sense of membership in the class.

Commitment to the student role is only part of maintaining order in classrooms. Order involves un-

derstanding the expectations for all classroom members, both general and specific expectations. It also involves being able to anticipate how others in the classroom will behave and believing that it is proper for everyone to behave in this way. Finally, order requires that most students conform to the expectations most of the time (Cohen, Intili, and Robbins 1979).

Sociologists have considered the conditions within classrooms that promote order. These include a set of tasks that are deemed clear, reasonable, and appropriate for the student, and for which there are adequate resources for completion (Cohen, Intili, and Robbins 1979). The arrangement of tasks within classrooms can contribute to building commitment to the extent that everyone participates in the tasks and is treated justly and fairly.

The system for evaluating student performance on assigned tasks also plays an important role in maintaining student commitment and order in the classroom. When tasks are not clear or when the bases for the evaluation of student performance are not clear, when students cannot predict how to act to achieve acceptable evaluations, or when expectations for student performance are unreasonable or contradictory, then students become disengaged from classrooms and their assigned tasks (Natriello 1996). Under these conditions students can withdraw effort from classroom tasks, act out, or even drop out of school. Such disengagement behaviors can start with one or a few students, but if the underlying conditions are not modified, the entire class can then become less fully committed and engaged in the work assigned to them.

DIFFERENTIATING AMONG STUDENTS

While investigations of the conditions for membership and order in classrooms concentrate on features of classroom life that bind students together, other investigations have focused on processes that serve to push students apart by differentiating some students from others. Work on the differentiation of students along racial and gender lines illustrates how sociologists of education have approached the issue of the social distinctions operating within classrooms.

At the classroom level studies of teacher behavior and teacher-student interaction have drawn from the teacher expectations tradition (Cooper, Baron, and Lowe 1975) that focuses on teacher behaviors that

might disadvantage students of minority racial and ethnic status. Early findings that teachers acted in ways that disadvantaged racial and ethnic minority students have given way to more sophisticated analysis suggesting that teachers react to immediate student performance and behavior as a result of the social organization of schools and that performances and behaviors that provoke disadvantageous patterns of teacher behavior are more likely to be associated with racial and ethnic minority status (Rist 1970; Natriello and Dornbusch 1983).

Studies of student interaction at the classroom level have come from the literature on classroom interaction and student behavior (Cohen 1982). Early studies that found that majority students harbored prejudices against minority students and engaged in student behaviors that excluded them from full participation in classrooms have given way to more recent studies, which produced more complex understandings of the ways in which both minority and majority students act to create patterns that disadvantage racial and ethnic minority students in the school (Fordham and Ogbu 1986; Miller 1983). Strategies for overcoming such impediments to full membership have included efforts to modify interracial interaction in classrooms (Cohen and Roper 1972).

Gender differences among student peers both in school and out are dominated by what Marlaine Lockheed (1985) noted as the tendency of children to segregate themselves on the basis of sex. Such sex segregation extends to verbal exchanges, work group membership, and friendship choices (Lockheed and Harris 1984; Hallinan and Tuma 1978), and beyond the classroom to the lunchroom and the playground (Thorne 1993). Janet Lindow, Cora Marrett and Louise Wilkinson (1985) observe that the tendency for children to associate with same-sex peers may stem from gender differences in behavior with boys being more active and aggressive and girls being more passive and compliant. This distinction was born out in Barrie Thorne's (1993) observations of elementary school students on playgrounds. Whatever the causes, the division of students along gender lines may lead to gender inequities as well as sex-role stereotypes (Lindow, Marrett, and Wilkinson 1985).

But segregation is not the only problem associated with differentiation along gender lines in schools. Research has also examined the potential for unequal

interaction by gender. For example, research on the operation of sex as a status characteristic has suggested that males are expected to be more competent than females and so are more likely to assume positions of influence in a group. Marlaine Lockheed and Karen Hale (1976) have shown that when group members have no previous experience with the material discussed in the group male high school students dominate group activity. Examining high-achieving eighth grade math classes, Noreen Webb and Cathy Kenderski (1985) found that males were more successful than females in obtaining help from peers when they requested it. Females were more responsive than males to requests for help. These patterns were related to the kinds of questions asked, with males more likely to ask for specific information and females more likely to express general confusion.

Attempts to address the problems associated with gender-based differentiation in schools have taken the same two forms seen in attempts to address the problems associated with differentiation along racial and ethnic lines. There have been efforts to identify, understand, and achieve conditions that promote equitable interaction across gender lines (Thorne 1993; Lindow, Marrett, and Wilkinson 1985; Lockheed and Harris 1984) as well as arguments that single-sex schools are more advantageous for female students than coeducational schools (Riordan 1990). Both strategies attempt to overcome the disadvantageous effects of gender differentiation in schools.

The major differentiating dimension within classrooms is intended to be student achievement. Indeed, classrooms are structured to highlight differences in student achievement. The assembly of students in schools makes racial/ethnic and gender differences immediately apparent. The performance demands of schools make ability differences salient nearly as quickly and directly. What features of schools and classrooms lead to the formation of conceptions of ability that allow students to differentiate themselves and their peers in terms of ability? Studies of the formation of ability conceptions (Rosenholtz and Wilson 1980; Rosenholtz and Rosenholtz 1981; Simpson and Rosenholtz 1986) have identified the unidimensional organization of tasks in classrooms as a set of key conditions that permit students to differentiate themselves by ability. Unidimensional classrooms are characterized by (1) undifferentiated task structures that facilitate social comparisons, (2) low

levels of student autonomy that restrict the variety of tasks and prevent students from forming their own evaluations of their performance, (3) the use of whole class instruction that makes student performance visible to all, and (4) the emphasis on grading as a clear unidimensional evaluation by teachers (Cohen 1985).

The unidimensional structure of classrooms leads students to form clear conceptions of their own ability and that of their peers. Carl Simpson and Susan Rosenholtz (1986) have found that unidimensional classrooms lead to more differentiated ability conceptions within classroom groups as well as to development of more generalized ability conceptions as students extend their view of themselves as more or less able to new and different tasks. Moreover, they report at least some evidence that unidimensional classes are associated with distributions of student power and popularity with students conceived as more able being more powerful and more popular. In addition, they report that students' liking for school as well as student effort and engagement are more dependent on ability level in unidimensional classes.

Much of the research on the formation of ability conceptions has taken place at the elementary level and, indeed, a key finding is that such ability conceptions begin to form in first grade (Simpson and Rosenholtz 1986). Students, no doubt, carry these conceptions and the patterns of behaviors and attitudes associated with them into secondary schools where at least the potential for more differentiated ability conceptions, as a result of multiple classes and teachers, is present. Moreover, research on adolescent students (Kramer 1991) suggests that social interactions in school continue to influence self-perceptions of ability, which then influence decisions about appropriate achievement-related behavior. The overall conclusion is that the social and organizational arrangements of formal schooling set in motion processes by which differences in ability, even relatively minor ones, become salient.

SOCIAL ASPECTS OF THE CURRICULUM

Sociologists of education have considered the social organization of knowledge as represented in the school curriculum from several perspectives (Young 1971). Each of these perspectives contributes to our understanding of how the curriculum is shaped by

the larger society and how the curriculum, in turn, shapes the schooling experiences of students.

The social organization of the curriculum has received attention. Basil Bernstein (1975) considers the curriculum in terms of the principles by which units of time and their contents are brought together in relationship to each other in schools. Two key dimensions are the amount of time devoted to a content area and whether study in an area is compulsory or optional. Content areas given more time and those that are required have higher importance or status than those given less time and those considered optional.

Bernstein also considers the relationships between content areas in terms of whether the boundary between them is clear and unambiguous or whether it is blurred. Content areas can be well insulated from one another or they can be open. Bernstein uses the term "classification" to refer to the relationship between content areas; strong classification means the content areas are well insulated from each other by strong boundaries.

Bernstein uses the term "frame" to refer to the strength of the boundary between what may be transmitted and what may not be transmitted in a pedagogical relationship. When framing is strong, the boundary between what is permissible and what is not is sharp and clear.

The strength of classification and the strength of framing may vary independently, and Bernstein uses this set of terms to discuss the influence granted to teachers and students in different educational systems or different educational programs. Strong classification reduces the power of teachers over what may be transmitted because it prevents them from stepping over content boundaries. Strong classification can also create a strong sense of membership and even identity in a particular class as the members of the class are granted access to content that is denied to others. Strong framing reduces the power of the pupil over what, when, and how knowledge is received as it increases the power of the teacher in the pedagogical relationship.

The social definition of knowledge has also been the subject of investigation. Here a key question concerns what knowledge is worth knowing, or, put another way, what knowledge is most important to possess. Sociologists of education have pointed out how groups within society use their power and influence to determine what knowledge is included in

the local or national curriculum, at least in part to secure advantage for themselves and their children by seeing to it that knowledge more likely to be possessed by people like themselves is included and deemed essential. So, for example, knowledge associated with high culture, may be included in the curriculum, while knowledge associated with street culture is excluded. Ivor Goodson (1992) provides an analysis along the same lines to explain the battles over whether to include science, particularly applied science, in the school curriculum in the nineteenth century. Adding science to the school curriculum was deemed dangerous by those who were influential because it allowed education to be more easily related to the cultural experiences of the lower orders. J. Shepherd and G. Vulliamy (1983) examine the treatment of music in the school curriculum in a cross-cultural framework and find that a clash between "school music" and "student music" evident in England was not found in schools in Ontario in Canada due both to the wider scope of what counts as school music in Ontario and to the noncompulsory nature of music study there. Analyses of other contemporary examples of how knowledge becomes part of the curriculum have examined ways in which the curriculum is used to legitimate certain political positions and perspectives (e.g., Anyon 1983).

Of course, the analysis of how certain knowledge becomes part of the curriculum would be incomplete without a corresponding examination of the social distribution of knowledge that is part of the accepted curriculum. The discussion of curriculum tracking above detailed some of the differences in the content available to students in different tracks within a school. There are also differences associated with student social class background, student race/ethnicity, and student ability. In addition to differences within schools, there are differences across schools associated with neighborhoods that differ by social class, differences by state, differences by racial/ethnic groups, differences by school in the case of special theme schools, and differences by sectors within higher education. Indeed, some of the effort of the contemporary school reform movement has been directed toward reducing the differences in the content knowledge made available to students in these different circumstances.

Gary Natriello

SOCIOLOGY OF SCHOOL IMPROVEMENT

The work of sociologists of education that chronicles the social dimensions of education at multiple levels leads easily to suggestions for reforming the educational system (Borman et al. 1996). Policymakers and practitioners regularly draw lessons from the reports of sociological research. Somewhat less common have been the efforts of sociologists themselves to design, implement, and evaluate programs and other interventions to improve schools. Four aspects of school reform seem particularly appropriate for consideration of policy-related work in the sociology of education: raising standards for students, reforming the system of financing schools, restructuring schools in a comprehensive way, and improving instruction of students in groups.

STANDARDS AND TESTING

The school reform movement of the last several decades has recognized the need to raise standards for student performance in schools so that students will be better prepared to function as adults in rapidly changing modern societies. The work of sociologists of education (Natriello and Dornbusch 1984) highlighted the low standards to which students were being subjected in U.S. schools. In particular, these studies explained that teachers had the lowest expectations for the performance of minority students, and these expectations resulted in lower standards. Minority students, in turn, devoted relatively low effort to their schoolwork.

Efforts to raise standards have taken a number of different forms over the past two decades. These have included increasing the requirements for teacher preparation, focusing the curriculum and eliminating courses deemed less demanding of students (Alexander and Pallas 1984), and subjecting students to more demanding standardized assessments of their performance. This last strategy of increasing reliance on standardized tests has been considered by a number of sociologists of education whose work offers various types of advice to insure that standards and testing do not operate to produce unintended negative effects.

For example, Edward McDill, Gary Natriello, and

Aaron Pallas (1986) highlight the potential for higher standards to increase the dropout rate among at-risk youth unless additional resources and supports were provided to help them achieve the higher standards. H. Dickson Corbett and Bruce Wilson (1991) describe the responses of one school district to standardized testing and cautioned that school-based educators may not be in a position to engage in the demanding and thoughtful educational programs envisioned by the policymakers setting the new higher standards. Kinnon Sheldon and Bruce Biddle (1998) suggest that the motivational impact of using tests to raise standards will result in students who are less likely to be lifelong learners. Linda McNeil (2000) argues that the standardized testing program in Texas actually impairs teaching and learning. Gary Orfield and Mindy Kornhaber (2001) marshal evidence that shows the complexities of implementing testing programs to achieve higher standards. Paul Weeden, Jan Winter, and Patricia Broadfoot (2002) maintain that the seemingly better test results in the United Kingdom do not mean that students are becoming better and more independent learners.

REFORMING SCHOOL FINANCE

The standards movement and the increasing reliance on standardized tests that accompanied it have provided a common well-defined set of expectations or outcomes for student performance in state after state. What the standards and testing initiatives did not provide is the resources to enable schools to prepare students to meet those standards and succeed on the tests. The gap between standards and resources is particularly acute in school districts serving large proportions of poor and minority students. This is a peculiarly American problem as the United States is virtually alone among modern states in funding education at the local level where the wealth of the immediate community substantially determines the resources available for schooling. This arrangement means that poor and minority students, those students whose educational needs are the greatest, are in communities and schools with the most limited resources.

Sociologists of education have considered the problem of unequal resources from several perspectives. Jean Anyon (1997) provides an historical analysis that

traces the problems of urban schools to the political and economic weakness of urban communities. She marshals evidence to show that social class and racial differences contribute to the impoverishment of urban communities and their schools and calls for broader social reforms. Doris Entwisle, Carl Alexander, and Linda Olson (1998) trace the problems in the school performance of adolescents to their earliest schooling experiences in poor urban schools. Using a life course perspective, they show how problems set in motion early persist throughout the schooling career and into adulthood.

William Firestone, Margaret Goertz, and Gary Natriello (1997) construct a multimethod case study of an effort to reform school finance to provide more equitable schooling experiences. Drawing on data on community conditions, the student populations, and schooling resources, they show how poor urban and rural schools are less able to meet the needs of their larger proportions of students at risk of educational failure. Even with the additional resources promised by finance reform, the schools serving disadvantaged students in their study continue to lag beyond their more well-off counterparts.

RESTRUCTURING SCHOOLS

Sociologists of education have long studied the structure of schools as social organizations (McDill and Rigsby 1973; Meyer and Rowan 1983; Tyler 1988). They have examined the impact of efforts to restructure schools as part of the school reform movement (Lee and Smith 2001).

A particularly active approach to school restructuring has been adopted by Legters et al. (2002) who have developed a model program for restructuring urban high schools to make them more effective at promoting student learning and achievement. The model encompasses a number of elements identified in earlier research that appear to enhance the chances for student success. Among the key aspects of the model they call the "talent development model" are an approach to involving faculty in the development

of the model, a focus on the initial grade in school for socialization purposes, longer class periods, career academies to link students to desirable futures, and investments in creating curricula that develop higher order thinking skills. This active program of school restructuring has been implemented in high schools and middle schools in high-poverty urban areas with encouraging evaluation results.

IMPROVING GROUP WORK

As part of efforts to understand social interaction in classrooms, sociologists of education have examined the nature of groupwork and student work groups (Slavin 1989), and they have worked to develop strategies for cooperative learning (Slavin 1983). Particular attention has been devoted to the interaction patterns among students with different status characteristics such as race, ethnicity, and gender, and to how such differences might lead to differential access to classroom resources as a result of differences in the opportunity to participate in group activities (Cohen and Roper 1972; Cohen 1982; Cohen, Lotan, and Catanzarite 1990).

Elizabeth Cohen (1994) has developed a program of research and development that has led to the design of groupwork strategies for classrooms where there are students with diverse background characteristics. These strategies provide guidance to teachers who wish to structure groupwork to promote equal participation and learning among diverse students. The process involves preparing students for groupwork by setting expectations for participation and structuring active roles for each member of the group. The approach also entails designing tasks that require all participants to engage in higher order thinking and to collaborate with their peers. Cohen's strategies have been implemented in classrooms in the United States and abroad (Cohen and Lotan 1997), and they represent a major application of the sociological approach to understanding social processes in classrooms.

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EQUITY AND CULTURAL ISSUES IN EDUCATION

The pursuit of equity has been central to the development of the United States. Much of what has transpired around issues of equity has resulted in the production of civil documents that attest to the history of peoples and their pursuit of equity. The pilgrims leaving England to seek life in a new land, free from religious persecution, and the subsequent drafting of the Mayflower Compact (1620) is one early example. The compact declares “the enacting of just and equal Laws, Ordinances, Acts, Constitutions, and Offices . . . [is] for the general good of the Colony.” The making and breaking of Indian treaties between European settlers and Native Americans further attests to peoples’ struggles in the United States over equity. The Declaration of Independence, U.S. Constitution, Bill of Rights, Emancipation Proclamation, Nineteenth Amendment (1920, granting women the right to vote), Executive Order 9981 (setting in motion the elimination of racial discrimination in the armed forces), Civil Rights Act (1964), the 1965 executive order of President Johnson (Affirmative Action), and the Americans with Disabilities Act (1990) are also examples of “equity” documents. These documents declare a movement away from “business as usual” to a newer and fairer way of thinking about equity.

Joseph Murphy (1992) offers three approaches to thinking about equity:

- (1) The “competitive/utilitarian” ethic argues that true excellence can only be achieved if the performance of “historically marginalized students rises dramatically.”
- (2) “Social justice” increases the “political clout of minority groups.”
- (3) The “caring ethic” approach argues that the

well-being of all people is “inextricably linked,” and that “equity of access to developmental opportunities will result when caring is emphasized.”

Considered individually or collectively, for most educators, these approaches encourage and legitimate their support of equity. However, Floretta McKenzie (1993) does remind us that any overarching set of beliefs usually has a single point of view that has more widespread recognition than another point of view. The cause for this is often the changing economic and political conditions in society. Such is the case with the civil rights movements of the 1960s and 1970s, which gave people of color and other marginalized groups increased political clout and helped to bring about improved dispositions toward issues of identity including race, disability, gender, sexuality, and religion—not only in society, but also in the realm of education. Thus, the pursuit of equity in the United States, while constant, involves competing and conflicting interests that serve to expand the United States’ citizenry and its developing conception of equity.

The pursuit of equity has driven educational reform. *Brown v. Board of Education* (1954), the Bilingual Education Act (1968), Title IX of the Education Amendments of 1972 (prohibition of discrimination on the basis of gender), the various mission statements of ethnic studies departments and programs at colleges and universities written during 1960–70, Public Law 91–142 (Education for All Handicapped Children [1975]), and the No Child Left Behind Act of 2001 (NCLB) address issues of equity. Many of these documents reflect the efforts of policymakers and common citizens fighting for social justice. For instance, in the case of Public Law

91–142, parents of children with disabilities pushed for legislation that would acknowledge and secure their children's right of access to education. During the 1960s and 1970s, college students launched the ethnic studies movement. Equity argues for the full inclusion of people otherwise relegated to the margins of society in general and of societal institutions such as schools.

In education, attention to equity at the level of policy and curriculum most often takes place in mathematics and science. This is because of the importance of mathematics and science to national interest. E. Linn (1993/1994) argues that in science and mathematics education, equity is an issue of "fairness" as well as one of "national self-interest." The fairness that Linn addresses is associated with discussions of culture and its connections to equity. R. A. Barrett (1984) claims that culture is "the body of learned beliefs, traditions, and guides for behaviors that are shared among members of any human society." Culture, according to W. Goodenough is "a system of standards for perceiving, believing, evaluating, and acting." The cultures of peoples, it is argued, needs to be central in the system of standards for perceiving, believing, evaluating and acting by which citizens live their lives. E. Franklin Frazier's *Black Bourgeoisie* (1965), Ronald Takaki's *Strangers from Different Shores* (1989), and Earl Shorris' *Latinos* (1992) all address Barrett and Goodenough's views on culture, and they speak to the influence of culture in the struggle for equity.

Since the 1970s, educators have increasingly referenced culture in relation to educational concepts and practices. Cultural pluralism and multicultural education are two examples. In 1915, Horace Kallen introduced the concept of "cultural pluralism." He argued that cultural pluralism was essential to democracy and that society should be diversified and unified (Gollnick 1997). Thus, cultural pluralism suggests acceptance and affirmation of cultural diversity, equality among groups of people, and a commitment to broadening society's recognition and appreciation of diversity. Some educators welcomed this more liberal way of thinking and applied the concept of cultural pluralism to education policies and practices. Cultural pluralism became (and still remains) for educators one way to bring together discussion of equity and culture in education.

Multicultural education is an outgrowth of the Civil Rights and Ethnic Studies movements of the

1960s and 1970s. It was supported and sustained by the work of several scholars including Carl Grant, Geneva Gay, Christine Sleeter, and James Banks, who argue for the acceptance of cultural pluralism, alternative lifestyles, social structural equality, power equity among groups, culturally relevant teaching, social justice, and social action wherever necessary. Concepts such as cross-cultural competency, cultural studies, cultural shock, cultural styles, and cultural transformation have become very much a part of the discourses on culture and equity. In addition, some of these concepts (e.g., culturally deprived and culture of poverty) have spun heated public debate and most have produced a large volume of text (e.g., culturally relevant pedagogy and cultural studies).

Some educators have specific ideas about the meanings and roles of culture in education. E. R. Hollins (1997), for example, argues that learning should address culturally mediated cognition. Within this argument, cognition and culture are mutually constructed during a child's growth and development. Additionally, Hollins (1997) argues that learning should include culturally valued knowledge. This concept suggests that quality and quantity of attention, as phenomenon, and the framing of perception are important in determining what constitutes culturally valued knowledge. This is accomplished more successfully when the learner and those who design school practice share or have an excellent history and knowledge of the surrounding culture. Moreover, Hollins argues for culturally appropriated social situations for learning. During enculturation (as part of understanding the world into which an individual is socialized) attention should be given to social relationships and social interactions with other individuals in specific situations, for specific purposes, and under specific conditions. The understandings acquired through this socialization process direct individual social behavior, as well as what is anticipated in the behaviors and responses of others. "These factors influence the efficiency and potential effectiveness of specific instructional approaches, curriculum designs, and social arrangements for learning for those from different cultural and experiential backgrounds" (Hollins 1997).

Attention to the influence of culture and equity on educational policy and practice, curriculum, instruction, and research/scholarship is increasing. Research on schooling has increasingly paid atten-

tion to and supported diverse cultures and equity. George Spindler's (1982) edited volume *Doing Ethnography of Schooling: Educational Anthropology in Action* was an early contribution to research that took into account issues of equity. *Doing Ethnography* helped scholars and researchers become aware of their need to pay attention to equity issues when they are conducting research, and to explain the significance of understanding how culture and equity are played out in schools and classrooms. Spindler states:

Our discipline emerged as a by-product of a colonial world where exotic "have nots" were studied by scholars from the "haves." That we fostered receptivity for cultural differences and argued for cultural self-determination, encouraged respect for the integrity of other cultures and worked against ethnocide is not to be denied . . . [W]e collected knowledge, facts, and insights from politically powerless people largely outside the benefit structure of modern economic and political systems. In doing so we gained a better understanding of the world and we built a discipline. (1982, 4)

The interconnection of culture and equity, and the significance of each to the lives of people cannot be overstated. Shorris's (1992) story about Bienvenida, a woman who never learned to speak English, makes this clear. Shorris states:

Although Bienvenida was not old when she came to the United States, she held on to her language and culture as if they were life itself. Indeed, when she died, it was not of illness but of English, for she had been condemned to a nursing home where no one spoke Spanish. (p.3)

THE ENTRIES

Four related themes link the thirteen entries in this chapter: conceptions of equity, identity and equity, at-risk students and equity, and strategies for equity. Jamel Donnor, Garrett Albert Duncan, and Walter Secada address conceptions and issues of equity. Anthony L. Brown, Scot Danforth, Adrienne Dixon, Stacey J. Lee and Angelina Catagno, Kevin K. Kumashiro, and Michael Thornton explore issues related to identity and equity. Keffrelyn D. Brown

explains how the at-risk concept/label is triggered when students are different from mainstream culture. Thandeka Chapman and Nikola Hobbel, Pepi Leistyna, and Karen C. Spear-Ellinwood and Luis C. Moll discuss how three concepts and strategies—multicultural education, critical pedagogy, and home-school relations—are used to address equity issues within a context of culture. The entry authors' discussions of culture and equity are not linear, static, or time bound. They address how conceptions of equity shift over time, and acknowledge the historical and social context that shapes the culture and equity discourse. Also, the entry authors critique assumptions of knowledge and what counts as knowledge and ways of knowing. In addition, the authors analyze race, class, and gender issues within the culture and equity discourse. They also illuminate the theoretical challenges facing this discourse.

Carl A. Grant

EXAMINING THE OTHER: THE OTHER IN EDUCATION

Critically examining notions of difference within a diverse society is crucial to understanding social relations. For example, race, religion, gender, and class difference have historically defined and shaped social interactions in the United States. Although these aspects of difference and diversity have brought a unique richness to social interactions, they have also brought varied degrees of contention and conflict. Historically, tensions around difference have had a lasting effect on the representations and images of particular groups of people. These perspectives of difference have generally produced an "us against them" dichotomy that has polarized communities of people around what is perceived as "different" and what is viewed as "normal." Here, those people and groups positioned as "us" symbolize normality, while those positioned as "them" are characterized as abnormal and not fitting in.

Certainly this type of "us against them" dichotomy can arise in most social situations where there are people of different backgrounds; however, what makes this perspective significant is the impact it has

on the life chances of particular groups of people. In recent years social theorists have referred to this process as “othering” or the making of the Other. Othering can be defined as a strategy of symbolic exclusion that is used to create artificial boundaries of race, culture, religion, sexuality, and gender difference.

The Other is a symbolic representation of abnormality or potential threat to what is viewed as normal. Within the social context of a community or an institution where homogeneous ideas, culture, gender, religion, and race exist, individuals, communities, and/or beliefs seen as “different” are generally constructed as the Other. For example, this process of othering can be explored through different contrasting social relations such as male/female, black/white, native/foreigner, and heterosexual/homosexual. This process of othering renders the Other as silent and spoken for, seen but not recognized, and imprisoned within an identity that has been predicated on myths, stereotypes, and false representations (Pickering 2001).

GENDER OTHERING

As previously noted, the process of othering generally involves two contrasting categories of people. Within traditional gender relations, this process has developed through contrasting and stereotypical meanings of who and what is defined as a “man” and who and what is a “woman.” Historically, within western societies, the defined societal roles each sex played was associated with the so-called progression of modern civilization. In other words, as nations developed, the boundaries of male roles and female roles became much more prominent. For example, in the United States these boundaries were generally arranged according to the roles men and women served within domestic and public life. The norms for both men and women were rigidly defined through social meanings associated with emotions and physicality. Within this gender context the man was defined as strong, rational, responsible, individualistic, stoic, and strong-willed, while women were stereotypically characterized as weak, irrational, caring, and nurturing. These descriptions placed men and women in very fixed societal roles. While men were able to move in and out of domestic and public life, women were generally confined to the role of mother and home-

maker. Although one can argue that within this context both women and men are limited to particular representations, feminist scholars have pointed out that women’s identities are often defined by a male norm.

In *The Second Sex* (1984), Simone de Beauvoir explores the notion of woman as Other by examining stereotypes that men historically constructed about women. Her central argument was that the objectification of women is what made them the second sex, or “sexualized Other.” De Beauvoir (1984) further states that through objectification women were constructed as what she called an “eternal feminine” symbolic boundaries of woman as dutiful, caring, and irresponsible. De Beauvoir states, “One is not born a woman; rather one becomes a woman” (p. 295). This quote illustrates that gender is socially produced and that gender inequalities are not a fact of nature. By the 1960s, feminist scholars and activists in the United States began to aggressively challenge this notion of women as Other in various social contexts. During this time, feminists in education began to point out how school cultures and curriculum in K–12 and higher education settings produced conditions that reinforced the construct of women as Other (Pinar et al. 2000).

GENDER OTHERING IN A SCHOOL CONTEXT

Feminists in education point out that the same cultural paradigms used to conceptualize females as the “sexualized Other” permeate school settings and contend that school may in fact serve as a primary institution for “educating” students about what is stereotypically male and female. Scholars have argued that the female is othered within all aspects of the school, including in the curriculum and in social relations (Bank and Hall 1997; Pinar et al. 2000). These scholars commonly suggest that school curriculum in the United States reproduces sex role stereotypes and produces the conditions for females to “opt-out” of particular subjects and schoolwide activities (e.g., sports, math, science, and technology). The female student as Other often impacts social relations within K–12 educational settings. It is not uncommon to hear boys in school say “you throw like a girl,” implying that “girl” codifies a natural or inferior physical ability in relation to boys. Or if a

boy reflects a certain emotion, such as crying, caring, empathy or concern, they might receive messages to “quit acting like a girl.” In these cases the school context illustrates how social relations and interactions harshly place cultural boundaries of male and female around a rigid conception of women and girls as the Other.

RACIAL OTHERING

Historically, race has been inextricably linked to the notion of the Other. As previously mentioned, this process of othering requires the use of an us and them binary, where one group of people is perceived by another group as different or abnormal. Like gender, racial othering attempts to position and solidly fasten in place an irrevocable schema about a particular racial group. Through the use of stereotypes and generalizations, permanent meanings of human behavior, culture, and intelligence are conceptualized through a racial lens. Since the fourteenth century skin color and phenotype have been used as a measurement of human behavior. Winthrop Jordan's *Black Over White* (1968) examines this notion of the Other over time by describing the initial interactions between English travelers and Africans.

Jordan (1968) argues that English travelers saw the Africans as a libidinous kind of people incapable of civil behavior. Countless entries in English travel journals consistently referred to African cultural difference and religious practice as being more acutely different than English culture. However, the most arresting characteristic of difference they recorded was the skin color of the African. References to the African and North African dark skin tone were often described through the exaggerated description of *black*. Jordan (1968) contends that the powerful impact that skin color had on Englishmen led them to develop a schema of color and blackness linked to human behavior and culture. In other words, their descriptions of Africans as savage and libidinous were equated with the blackness of their skin. Through the nineteenth and twentieth century, skin color continued to serve as the primary marker for racializing the Other. For example in the United States, black skin codified an inferior racial status, which resulted in social policies that barred black Americans from equal access to jobs, housing, and education. To justify such social practice, scientists in Europe and

throughout the United States developed a “scientific” racial hypothesis. These scientists claimed that particular groups of people such as those with darker skins had a limited, genetically inherent capacity for intelligence, thus justifying their social status as a *natural* consequence of their race (Pickering 2001; Scott 1997).

However, not all groups of people described as Caucasian were excluded from this hypothesis of the racial Other. During this period references made to people of Irish ancestry were based upon a racialized lens that made fine distinctions between “types” of European people. The Irish were positioned against an English or German conception of whiteness, which was generally described as an ideal representation of the Caucasian race. This process of “white othering” disassociated and symbolically excluded the Irish from mainstream society. Several caricatures were used to depict the Irish as a “unique” kind of Caucasian. They were described as backward, dark, low-brow, debased, disorderly, and naturally inferior (Pickering 2001, 142). Also it was not uncommon in Britain and in the United States to draw parallels between the Negro and the Irish (i.e., the Irish were referred to as the “European Negroes”) (Jacobson 1998, 9). However, while this type of “white othering” marginalized many white European (e.g., the Polish and Italians) immigrant groups, skin color generally served as the primary marker for racial othering throughout the twentieth century.

RACIAL OTHERING IN A SCHOOL CONTEXT

Exploring this notion of the Other within a school context reveals how students of color are categorized and sorted according to various generalizations and stereotypes. Since the 1970s scholars in the field of education have increasingly argued that schools are not neutral institutions. Schools reinforce and reproduce existing mainstream, societal norms and beliefs. Also studies reported that race is implicitly and explicitly used to negatively impact a child's educational experience (Ferguson 2001; Lee 1996). Consistent with the notion of othering, various “us” and “them” relations emerge within schools to define particular racial groups as “dumb,” “smart,” or “intelligent.” For example, in U.S. schools it is not uncommon to see African American boys solely characterized as

“premier” athletes, yet never positioned as “scholars” or pressured to take advanced or college level courses. This is not the case for Asian American students, who are typically over-generalized as the “model minority,” because of their perceived high academic ability. Stacey Lee’s *Unraveling the Model Minority* (1996) illustrates how the notion of Asian American students as the model minority emerges and is sustained in relation to a perception that African American students are generally lazy, undisciplined, and unintelligent. Lee (1996) reports that ascribing such an identity to Asian American students over-generalizes their experiences and silences them in critical discussions around race and schooling.

UNRAVELING THE NOTION OF OTHER

Understanding the effects of othering in various social contexts, including schools, is a complex task. Simple solutions such as color-blind or gender-blind identity politics offer ineffective strategies when unpacking the multiple historical and socially produced layers that have created these conditions. The notion of the Other is a strategy for condensing various images into a fixed ideological construction of otherness that can serve as a way to rationalize hostility and bigotry (Bhabha 1993). Unraveling the social production of the Other requires an analysis that examines how this concept emerges over time within both the local and global context. This type of analysis will allow schools, workplaces, government agencies, and various other spaces to ask questions and explore solutions that can more effectively counter the making of the Other.

Anthony L. Brown

ACADEMIC RISK, SCHOOLS, AND U.S. SOCIETY

Today, it is not uncommon to hear the term “at-risk” used in educational circles when referring to particular populations of students believed more likely than their peers to experience low academic achievement and educational attainment. In 2002, the National

Society for the Study of Education published *Educating At-Risk Students* (Stringfield and Land 2002), an edited collection of essays devoted to the examination of educational risk at the K–12 levels. Collectively, this text highlights the importance educational researchers and U.S. federal policy place on understanding and addressing the idea of risk; the U.S. Department of Education (USDE) and the Office of Educational Research and Improvement (OERI) funded all of the research included in the collection. Such efforts reflect a longstanding trend in education and the social sciences that assume it necessary to clearly identify students who seem both less likely than their peers to experience academic success and who present a challenge in the learning and teaching process. It is perhaps not surprising that traditionally, these students have generally come from backgrounds positioned as marginal or different from mainstream (i.e., white, middle class) U.S. society. Policymakers and educators alike have justified such practices because of fears that traditional “American” values, as well as economic viability will suffer if there is not some plan of risk identification and intervention in place.

EXAMINING THE TERM “RISK”

When considering the idea of risk, clarification of the term and its usage is vitally important. The idea of risk denotes fear or chance of impending, probable danger. While noting that the origin of the word risk is unknown (Luhmann 1993), authors typically agree that during the Middle Ages in Europe, the term had significant application in the navigation and trade fields (Ewald 1991; Luhmann 1993). During this time, magic, along with elements of Christianity, formed the foundation of many peoples’ belief systems; threats and dangers were understood in ways that helped individuals feel they had some control over their lives. The idea of the supernatural (both a vengeful God and an evil Satan) was a commonly accepted aspect in the notion of superstition, which was often relied upon to deal with both the evil and the unknown. Here, risk was associated with natural events, such as storms, floods, or epidemics and was characterized as a danger associated with the acts of God, rather than the direct result of human fault (Lupton 1999). Then, as well as now, risk evoked the ideas of uncertainty and potential damage, par-

ticularly in relation to some item of value, whether loss of property or life. It was not until the eighteenth and nineteenth centuries that modern European and American societies viewed risk as something to be actively avoided or at a minimum managed, except during those times when the potential benefits of some risky action outweighed the possible dangers or costs. As such, risk could denote either “good” or “bad” qualities.

Today, literature focused on risk spans a variety of academic and social fields. This work covers various aspects and perspectives associated with the science of risk, including risk calculation, risk assessment, risk evaluation, and risk management. When organized in this manner, risk becomes something capable of rational observation, measurement, and analysis, ultimately allowing those concerned with risk some strategic methods for gaining a sense of control over an unwieldy, uncertain risky future. This perspective on risk represents ways of thinking that emerged in the nineteenth century in Western European countries and in the United States. These perspectives made it possible to control the future, by way of the present, through the use of probability and statistics.

I. Hacking (1990) traces the connections between the eroding views of the natural world as determinant and the formation of laws of probability that applied to the characteristics of people. Prior to the 1900s, probability, or the “doctrine of chances” was viewed as the “defective but necessary tools of people who know too little” (Hacking 1990, 1). During this time rational thinking prevailed with the assumption that probability reflected too closely the notions of “chance, superstition, vulgarity, [and] unreason” (p. 1). It was not until after the 1900s that the use of statistics and probability became both a viable and desirable option. As a result, notions of normalcy and deviance became scientifically calculable concepts. And while these new laws of probability implicitly relied upon laws of nature, they were uniquely suited for calculating aspects of people—both their behaviors and their human nature.

In this sense, who and what was considered normal was (and continues to be) based upon certain socially and scientifically acceptable beliefs, often supported by statistical evidence that prior to the nineteenth century Western European scholars did not acknowledge as rational or useful. What is normal (or deviant) emerges not from some inherently

static, innate, or deterministic category of people, behaviors, or things, but rather, reflects specific practices and beliefs, culturally sanctioned as both scientific and necessary (Hacking 1990, 2002; Rose 1999; Foucault 1980). That some people, behaviors, and things come to embody particularly deviant or risky natures is one result of these practices. And while several prominent risk theorists suggest that risk has a universal, timeless quality for all groups of people (Beck 1995; Douglas 1992; Luhmann 1993), others argue that the practice of managing risk could not have become known if not for the advent of new ways of thinking that emerged during the nineteenth century (Hacking 1990, 2002).

CHALLENGES TO U.S. PUBLIC EDUCATION, 1880-1940

While the specific terminology of risk in education became popularized with the publication of passage of *A Nation at Risk* in 1983 (National Commission on Excellence), the underlying issues associated with the term and schooling have existed at least since the mid- to late nineteenth century in the United States. Since the late nineteenth century, school administrators and teachers have attempted to identify students who presented a challenge to the teaching and learning process. This was particularly the case in schools situated in urban contexts as these locations were faced with difficult working conditions, exacerbated by increasing enrollments from newly arriving immigrants from Europe, the passage of compulsory school attendance laws, and increasing numbers of students attending school with physical disabilities.

For example, during the late 1800s schools and educators began to challenge the common school notion that all students should, or were, capable of receiving the same education. Many educators at the time argued that such a policy, while good in an ideal sense, did not address the individual challenges posed by students who did not typify the ideal, or so-called normal student. These students were often characterized as overage, or too old for the particular academic and intellectual grade level in which they were placed or, in some cases, they possessed some perceived physical or mental disability that was believed to impede their overall intellectual ability to learn and function “normally” in the classroom. During this time, public school systems located in large,

densely populated urban areas such as New York City, begin to push for differentiated curriculum, signaling a move away from the ungraded school model.

Psychological and sociological literature during the early to mid-1900s in the United States were concerned with using methods of science to identify and categorize the problems faced by individuals living in an industrial, urban social context. There was growing concern about educating the children of immigrants (Richman 1906), with increasing attention paid to the children of recent African American migrants from the southern regions of the United States (Blascoer 1915). During the late nineteenth and early twentieth centuries there were two ways for explaining the intellectual capability of students positioned as “different,” and potentially deviant from the mainstream society. The first commonly suggested that students of African American heritage, as well as immigrants from southern and eastern European backgrounds were incapable of intellectual achievement because of innate, genetic deficiencies. By the 1920s, however, these explanations were under increasing attack for their seeming lack of empirical data. In their place emerged arguments that pointed to the important role played by environmental factors on the development of intellectual potential. It was believed that the challenges posed by poverty and urban life, rather than one’s genetic disposition, made it difficult for certain students to achieve intellectually and live a moral life.

Urban life, particularly for those living in poverty, was seen as uniquely maladaptive and problematic for the poor and their children. The desire to eliminate, or at least control, the negative influence these potentially deviant people might have on the larger society justified actions taken by researchers, social welfare agents, and school officials to better understand how to meet these students’ perceived exceptional needs. The work of philanthropic organizations, such as women’s clubs and settlement houses (Addams 1911; Rouse 1984), point to efforts made to ameliorate the effects of poverty, immigration, and other social conditions thought to impact both the intellectual and moral growth of certain children. Ultimately, these students were viewed as problems that made the task of the teacher, and ultimately the school and school district, more difficult. The creation and increasing popular use of intelligence testing provided a scientifically efficient

method for identifying and categorizing students on the basis of their presumed intellectual capability. This process would offer students the education needed to prepare them for their “proper” place in society.

CHALLENGES TO U.S. PUBLIC EDUCATION, 1941-1982

During the mid-1940s, and well into the 1960s, there was another wave of African American migration and Afro-Caribbean migration into large urban centers across the country. Simultaneously, immigrants from Spanish-speaking countries in the Caribbean and Mexico also moved into crowded urban enclaves. This increased migration to large cities, coupled with the flight of white Americans to the suburbs, led to a demise of jobs and resources within urban cities. The result was a high concentration of poor and working-class people, primarily black and Latino, within the largest U.S. cities. These conditions helped widen the increasing gap between poor people of color and their white counterparts along various social, economic, and academic indicators. To address these concerns the federal government assumed a more prominent role in addressing poverty and its effects on U.S. life through President Lyndon Johnson’s War on Poverty programs. One result, the *Elementary and Secondary Education Act of 1965*, ushered in a proliferation of educational research at the K-12 level that sought answers to why students of color, primarily African American, Mexican American, and Puerto Rican American, experienced lower academic achievement than their white counterparts across the United States. Simultaneously, researchers began to investigate what schools, teachers, and students needed in order to increase the academic performance of the poor and students of color in urban areas. While some authors recycled theories from the early twentieth century that presumed innate, genetic deficiencies accounted for these students’ lower academic achievement, such explanations were challenged by those who suggested the environment and cultural practices played a pivotal role in potential academic performance. Proponents of the latter view believed students in urban schools, as well as the families and communities of which they were a part, lacked the necessary skills, perspectives, and cultural understandings to successfully navigate within the world of school. This notion of cultural

deprivation assumed that differences in academic achievement between poor and/or students of color and their counterparts from white, middle-class backgrounds originated in the deficient family ecology of the former students, rather than inside their genetic code. Much of the work in this area focused on the cognitive and linguistic implications of parenting strategies used with children of color and/or those living in poverty.

Many researchers disagreed with these findings and pointed out that research rooted within cultural deprivation or deficit models tacitly accepted and utilized white middle-class skills, perspectives, and cultural understandings as the standard criteria for comparison. Critics of cultural deficit models suggested that the cause for low achievement among the poor and students of color was more likely a result of cultural differences that existed between the cultural values rooted in the school and those found in the child, the family, and the community in which the student lived. Proponents of this perspective argued that students in urban schools, as well as the families and communities in which they lived, came to school with distinct perspectives and beliefs about the world and education that often conflicted with the existing cultural values found within school, school personnel, school systems, and the larger socioeconomic and political system. These authors suggested that in order for student achievement to improve, schools must find ways to adapt to the perspectives and values of the student, rather than try to fit the student into the existing structure. This perspective focused on the inequitable practices of schools and school systems that lead many poor and/or students of color to experience low academic achievement and educational attainment. These highlighted the deficiencies of institutions and their practices, such as unequal school funding, inadequate teacher preparation, lack of multicultural curriculum and inclusive instructional strategies, and low teacher expectations for student learning.

CHALLENGES TO U.S. PUBLIC EDUCATION, 1983–PRESENT

The publication of *A Nation at Risk* in 1983 represented the next wave of federal attention focusing on the effectiveness of U.S. schools. This policy pointed to the impending dangers facing the United

States with regard to existing mediocre standards for academic achievement, and sought to renew the nation's commitment to K–12 and higher education. Unlike the *Elementary and Secondary Education Act of 1965*, *A Nation at Risk* did not specifically address concerns associated with educating students from disadvantaged backgrounds. However, policymakers, researchers, and educators picked up the language of risk, specifically as it evoked fears about the continuing strength and future economic vitality of the United States. Throughout the 1980s, federal policy and the education field shifted its focus from a nation at risk to one that viewed particular students as at-risk. While initially discussed in the field of psychiatry and developmental psychopathology during the 1970s and early 1980s, “at-risk” became the term of choice when discussing students who were believed more likely than their peers to experience low academic achievement and educational attainment. The underlying goal of this practice was to identify, at the level of the individual student, the origins and specific risk factors that made low academic achievement and educational attainment more likely to occur. In doing so, it was believed that school systems, teachers, psychologists, and other providers could provide the remediation and intervention necessary to assist these students. The research that had accumulated over the past four decades that examined the relationship between individual, familial, and social characteristics, and one's resultant achievement, IQ, and social competence, was used to identify the risk factors associated with low achievement. While there was (and continues to be) no definitive agreement on the risk factors that place a student at risk, G. Natriello, E. L. McDill, and A. M. Pallas (1990) identified the following most frequently cited and researched individual/family-level risk factors associated with the “atrisk” student: (1) poverty, (2) race/ethnicity, (3) limited English proficiency, (4) parents' educational attainment, and (5) single-parent family homes. This approach to understanding issues of risk followed an epidemiological perspective (Swadener 1995) that attempted to locate the causes and factors that ultimately lead to a pathological state. In the context of this literature, a student characterized as at-risk technically refers to a student who is part of a population of people who either have or have a high likelihood of coming into

contact with risk factors associated with the occurrence of some negative outcome.

However, throughout the mid-1980s and into the present, the term at-risk has taken on a life of its own, becoming a descriptor that generally represents students of color, those who are poor, disabled, or for whom English is a second language. These perspectives of risk, specifically as they relate to schooling have been criticized for their seeming adherence to culturally deficit models of thinking (Swadener 1995). It is argued that these risk perspectives were the result of longstanding social constructions that positioned students of color and their families, as well as those living in poverty, and those with particular kinds of special needs, as problematic, abnormal, and potentially deviant. Researchers interested in the socially constructed nature of risk as it plays out in school systems and classrooms have noted the flexible ways in which this notion is utilized and acted upon on students perceived as at risk for low academic achievement (Richardson et al. 1989).

By the 1990s, there were at least two emerging ways to discuss such students in relation to education and schooling. Both perspectives challenged the negative undertones associated with categorizing these students as at risk. One school of thought, situated within a social construction model, advocated the need to refer to these students as “at-promise,” or “placed at-risk,” rather than as simply “at-risk” (Swadener 1995; Boykin 2000). Such a move, these authors suggested, shifted the focus from students and families and placed responsibility on school systems in meeting the needs of students who faced challenging life circumstances. In the 2002 National Society for the Study of Education (NSSE) publication, *Educating At-Risk Students*, Deborah Land and Nettie Legters cite the following school-level factors associated with placing students at risk: (1) school-level poverty, (2) class size, (3) school size, (4) urbanicity, (5) expectations, (6) school violence, (7) tracking, (8) special education, (9) retention, and (10) suspensions and expulsions. Another school of thought, situated in a wellness model that emerged in the 1970s in the fields of psychopathology and developmental psychology, believed it more useful to examine why some students, in spite of their proximity to risk factors associated with low academic achievement and educational attainment, in fact, succeed academically. These resilient students, who ironically had always existed, became the models to

understand and emulate. Such work sought to identify the protective factors that buffer or, in some cases, ameliorate the effects of the negative risk factors these students faced in their lives, in the hope of creating effective intervention and prevention programs for students facing similar conditions. What is interesting about this discourse is the way that it seemingly moves beyond the idea of risk, while simultaneously relying upon the notion of risk to validate its claims. As such, the resilient student is always potentially “at-risk.”

EVOLVING TERMINOLOGY AND FUTURE CHALLENGES

Since the early history of public schooling, schools have faced the challenge of meeting the academic needs of all students. Students positioned as different or abnormal were typically the ones who found it difficult to navigate within school settings. Whether these students were characterized as such on the basis of their perceived immigrant status, physical or mental ability, class status, cultural, or racial background, these students were seen as threats to the nation’s economic vitality and moral standing. Throughout this history, however, educators have challenged these ideas, pointing to how normalization, or the sociocultural process by which particular people, beliefs, and ideas become positioned as correct, natural, and reasonable, informs who and what is considered normal. As demographic shifts continue to occur across urban, suburban, and rural school contexts in the United States, it is not likely that issues related to presumed academic risk (no matter how cleverly disguised in new terminology) will disappear in the years to come.

Keffrelyn D. Brown

MULTICULTURAL EDUCATION AND ITS TYPOLOGIES

Since its inception, public education in the United States has been focused on creating a kind of common culture among its citizens, a culture that will allow its democratic ideals to thrive. Although it was

not always called multicultural education (this term was coined in the 1960s), competing ideas about whose values, history, and culture were to be transmitted and promoted through public schooling have always lain at the heart of educational debates in the United States.

At the turn of the twentieth century, the Commission on the Reorganization of Secondary Education published its *Cardinal Principles of Secondary Education* (1918), which responded to the influx of Irish and eastern European immigrants by creating a comprehensive high school that offered a curriculum of “health, command of fundamental processes, worthy home membership, vocation, civic education, worthy use of leisure, and ethical character as the seven ‘main objectives’ of American secondary education” (Cremin 1964, 93). The *Cardinal Principles* sought to change the habits and ways of thinking of recent immigrants in order to prepare them for full participation in the dominant U.S. culture. Underlying the principles was the notion that the dominant U.S. culture was the desirable and proper one, and that the cultures represented by immigrants (Irish culture, Catholicism, Judaism, etc.) were not beneficial either to the immigrants themselves or to the larger society in general. The principles’ seven main objectives heralded a century of debate about whether schools should respect and include knowledge of cultures other than the status quo. This debate, which centers on whether or not we should build an egalitarian, democratic society by assimilating “outsiders” into the mainstream or whether we should respect and include all people in our public institutions, especially schools, forms the basis for ways of thinking about multiculturalism in education.

Multicultural Education (MCE), as it is called today, began as a response to the demands of the civil rights movement, the consequent dissolution of neighborhood schools due to desegregation, and the continued debates from the turn of the century over what should and should not be taught in schools. The first definitions of MCE focused on restructuring schools to better serve the needs of children of color and poor children. Underscoring these definitions was a range of philosophies of how best to achieve the goals of a democratic society; these included assimilation of minority groups into the mainstream, liberal pluralism in which mutual tolerance was the goal, and radical reformations of the ways in which schools function. As teachers and teacher educators tried to make sense

of multicultural education and created new programs, the paradigm took on an elongated shape that stretched from very limited reform efforts to detailed overhauls of systematic structures and perceptions of students, teachers, and communities.

Initial reforms centered on creating curriculum that was more inclusive and represented varying cultural viewpoints. The ethnic studies movement demanded that school curriculum reflect the “perspectives, struggles, dreams, and realities” of people marginalized in U.S. society: African Americans, Latinos, women, and people with disabilities (Banks 1996, 40). Ethnic studies was the first phase of multiculturalism; however, educators involved in this phase soon realized that interrupting the cultural status quo of public school curricula was not enough to bring about restructuring of schools in order to assure educational equity for all students. How schools could offer an equal and equitable education to all students and how they could produce a critical citizenry informed these questions: What did multicultural education really mean? What did it look like in practice? In order to answer these questions, educators developed programs, curriculum reforms, and theoretical rationales to guide the development of multicultural education. As multiculturalism developed in many different sites and from varying political perspectives, its meaning and practice became contested and, at times, even vague.

TYPOLOGIES: MAPPING THE TERRAIN OF MULTICULTURAL EDUCATION

Given the broad range of programs and approaches that researchers were documenting, the construction of typologies emerged to explain and describe the field. The primary purpose of early typologies was to spell out the assumptions of multicultural education. In the next phase of theorizing about MCE, authors created typologies to critique education that proclaimed itself multicultural, but was not delivering the desired results of equity and cultural critique. The most recent typologies map out how various political camps have used the ideas of multiculturalism to promote their own kinds of educational reforms, and to challenge the ideological nature and uses of MCE. Typologies have remained useful in MCE because they provide both an overview of the field and a detailed qualitative scale to describe

modifications. They give form to the continued debates over equity and access for all students that spurred the creation of MCE.

Researchers frequently refer to the following five typologies of multicultural education: monoculturalism, individualism and understanding, cultures in isolation/group power, universalism, and emancipatory. Considering the thirty-year time period during which these typologies were constructed, they also provide a historical view of changes in the field of MCE. While there are other typologies that have been created, these five deal specifically with issues of teaching and learning in K–12 classrooms (See Table 10.1).

DEFINITION OF TYPOLOGY

Multicultural Education typologies are defined as systems of categories that classify both documented and ideal approaches to learning, teaching, interacting, and serving in equal and equitable environments. Although education research has been utilized to create the typologies, the five under discussion here do not include reviews of research in the field of MCE; they only include programmatic initiatives. The venues for initiatives are most likely to be K–12 classrooms; however, higher education programs, businesses and corporations, and government offices have also implemented different levels of multicultural education in order to better serve their constituents.

Because debates concerning the merits and necessity of multicultural education reach beyond the K–12 classroom and university schools of education into public conversations about cultural sensitivity and tolerance, it is essential that the broad impact of multicultural education on society be taken into account. Multicultural education, born of the civil rights movement, cannot be separated from society's greater struggles to understand and embrace the multiplicity of cultures and peoples that make up the citizenry of the United States. This is why these conversations continue to extend beyond the K–12 classroom. This review of the typologies and the purposes they serve demonstrates the applicability of the levels to various types of programs.

PURPOSES OF MCE TYPOLOGIES

The multicultural education typology's primary purpose has been to provide conceptual clarity to the

field of multicultural education. This purpose stems from the fact that various scholars over the past thirty years have envisioned MCE in a myriad of ways. As the field of education continues to change, the typologies have also changed. The changes in the field made it necessary for the typologies to expand from a primary focus on race, gender, and ethnicity to include areas such as students with physical or mental exceptionalities, issues of sexual orientation, language difference, and a greater emphasis on social class.

There are several other benefits to the construction of MCE relating to the overall desire to help scholars and students better understand the gamut of approaches that may be considered in designing and implementing multicultural education. Typologies provide:

- scholars with a language for debate and critique in academic arenas
- students and scholars with a means to grasp the concepts of MCE in both a pedagogical and historical format
- an introduction to preservice and inservice students who are not familiar with the field of MCE
- a synthesis of the existing concepts and research in the field of MCE
- a qualitative measure for teachers to use when they reflect on their practice
- a qualitative measure for researchers to describe and critique what occurs within classrooms

As seen in Table 10.1, each typology begins with the lowest level of multicultural education. In some cases, this level is defined by the dearth of curricular reforms focused on meeting the needs of all students. The primary level is often a description of a traditional approach to education with its focus on Eurocentric content, limited attention to diverse children's communities or family backgrounds as a source of strength, and rigidly aligned structures that leave little room for students and their parents to actively participate in the learning environment.

Each consequent level of the typology shows a change in the way that the classroom teacher and school administration view their students, their backgrounds, and their contributions to the school. The levels may function as autonomous stations in which teachers view their practice, or they may describe stages of development in which teachers and schools

Table 10.1

Typologies of Multicultural Education

	Monoculturalism	Individualism and Understanding	Cultures in Isolation/ Group Power	Universalism	Emancipatory
M. Gibson 1976	Education for the culturally different or benevolent multiculturalism	Education about cultural differences or cultural understanding	Education for cultural pluralism	Bicultural education	Multicultural education as the normal human experience
R. Pratte 1983	Restricted multicultural education		Modified restricted multicultural education	Unrestricted multicultural education	Unrestricted modified multicultural education
C.A. Grant and C.E. Sleeter 1986	Teaching the exceptional and the culturally different	Human relations	Single-group studies	Multicultural education	Education that is multicultural and social reconstructionist
S. Nieto 1992	Monocultural	Tolerance	Acceptance	Respect	Affirmation/ solidarity/ critique
C. McCarthy 1993	—	Cultural understanding	Liberal MCE	Cultural emancipatory	Critical emancipatory
P. McLaren 1994	—	Conservative	Liberal	Left-liberal	Critical and resistance MCE
J. Banks 1995	—	Contributions approach	Additive approach	Transformative approach	Political Action

seek to move through the levels and attain the ideals of multicultural education. The transitional stages focus on various aspects of teaching and administrative responsibilities. These levels often describe classroom practices, and they may see the individual teacher as responsible for creating and implementing changes to the curriculum. Changes generally include racially and ethnically diverse content and materials, attention to gender bias, structured activities that bring the students' families and communities into the classroom, discussions of equity and equality in the literature, and the maintenance of high expectations for all students.

The authors of these five typologies use them to critique assimilation and pluralism. They focus on the devaluing of cultures and races different from that of the mainstream, i.e., white, middle-class population of students. Teaching from an assimilationist perspective also places greater value on Eurocentric norms, values, knowledge, and achievements. The authors generally use their lower levels to investigate the conception that education is a tool to make students conform to particular definitions of academic achievement, proper behavior, and speech.

Conversely, these authors also challenge the belief that various racial groups should be tolerated, celebrated, or function in isolation from each other. These typologies describe the struggle of how best to represent various aspects of groups of people without stereotyping them or placing limits on a group's identity. According to the authors, pluralism does not allow for the individual student to function both within and outside of their group membership. Further, pluralism also depicts culture as essentially stable, instead of as a constantly changing social force.

The stages culminate in a proposed ideal, a final level of multicultural education. Although all of the typologies were constructed before Carl A. Grant and Gloria Ladson-Billing's (1997) comprehensive definition of multicultural education, this definition can be used as a template for discerning the multiple components necessary for schools to meet the ideal levels of MCE found in each typology.

The final level is rarely attainable in public schools because it requires programmatic, structural, and institutional reforms that are difficult for public institutions to implement in isolation from greater changes in the state. This is not to claim that educa-

tors have not built such programs in the United States, just that there is scarce documentation of them. While the authors of the various typologies provide criticism on the lower levels of their typologies, they do not critique their ideal levels. Instead, the final level of the typology stands as a call to action, or a template to which educators should aspire.

PAST AND PRESENT TYPOLOGIES OF MULTICULTURAL EDUCATION

In the following section, a brief overview of each of the five typologies is given. The full typologies and the authors' reasoning behind each of them can be found in the articles listed in the reference section. The names of each stage are detailed in Table 10.1. These groupings are not rigid, finite categories; indeed, within each typology the levels intersect and overlap. Therefore, the chart serves only as a visual representation and point of reference.

Margaret Gibson constructed the first typology in 1976. Gibson created it based on her review of empirical research and scholarly works published by the American Association of Colleges of Teacher Education (AACTE) and the Educational Resource Information Center (ERIC) of the U.S. Office of Education. She constructed the typology to reflect the values, strategies, outcomes, and target populations of each of the levels. She acknowledges that each of her first four levels has limitations concerning deficit perceptions of children of color and their communities, tensions between pluralism and assimilation, and the differences between tolerance and understanding. In each of her levels, Gibson connects the history of multicultural education, its various constituents, and the assumed political outcomes of the education she describes. Gibson's purpose in constructing her matrix was to show the progress that had been made in MCE while lighting the way to future goals. Specifically, she highlighted the benevolent nature of current practices, but that education for the culturally different still maintained the status quo. She was interested in developing approaches that saw multicultural education as the *normal* human experience, instead of an education that viewed one culture as more valuable than another. An interesting note is that Gibson was one of the first authors to discuss bilingualism as a component of multiculturalism.

R. Pratte (1983) gives a succinct overview of multicultural education through his four levels. Unlike Gibson's levels that begin with monoculturalism, Pratte argues for a limited mix between monoculturalism, individualism, and understanding. This is perhaps because, by 1983, it could be assumed that given the powerful push towards MCE in the 1970s, the majority of classrooms had undergone some changes, however limited in scope. Pratte's typology deals with both the elements of classroom practice and the provisions for school services, such as meals and extra-curricular activity planning, for all students. The fundamental difference between Pratte and all of the other authors is that he uses the approach of pure logic to argue for educational changes. This is not evident in other work because the language of formal logic is itself rooted in Western canonical traditions, which multiculturalism is seeking to disrupt. Pratte's language is not couched in the language of civil rights and educational equity, although he argues for these nonetheless.

C. A. Grant and C. E. Sleeter (1986) primarily focus on the teacher's responsibility for MCE in pre-K–12 classrooms until the fifth and final level in their typology. The final level calls for a comprehensive restructuring of curriculum and services to meet the needs of all students. The initial Grant and Sleeter typology gave attention to issues of gender and social class that had not been examined previously. This typology has been revised several times to reflect the inclusion of new forms of difference and bias such as disability, sexual orientation, and religion. Grant and Sleeter are interested in synthesizing current practices and placing them on a continuum. The use of a continuum recognizes the importance of individual teachers' practices while still underscoring that those individual teachers can only take MCE to a certain point. These authors are therefore concerned with balancing the responsibility of teachers with the responsibility of the greater society in making the United States live up to its democratic ideals. In addition, the continuum can be used as a vision statement to guide institutional and instructional reforms.

C. McCarthy (1993) moves the typology from a focus on classroom interaction to the types of discourse, or language, surrounding the teaching and promotion of multicultural education in K–12 classrooms. He addresses issues of representation found in language used to discuss educational equity and

access. His four levels describe the differing ideologies as to what it means to be an educated citizen in the United States. McCarthy's neo-Marxist and post-colonial perspectives are apparent in his discussion of subordinate and dominant groups and the United States' links to global capitalism. McCarthy's categories ask us to critically reflect on the political uses, in the public domain, of the language and ideas of multiculturalism. This author sees enhanced freedom in cultural critique, which he both uses and espouses.

Similarly, P. McLaren (1994) uses the political language of Marxism to describe the four levels in his typology. His typology focuses on public conversations about social and educational opportunities for United States citizens. He asserts that each form of multiculturalism has a political agenda and that his final level, critical and resistance multiculturalism, must use both public and private venues to contest and critique societal norms that maintain the status quo. McLaren asks educators to constantly rethink, from their positions of power, the effects of their allegiances and practices. His purpose is, in part, to disrupt the status quo by standing *with* those people who have been oppressed by institutions, including schools.

By contrast, J. Banks (1995) provides a typology for multicultural curricular reform that speaks to political action only in the final approach. Banks, however, has constructed his typology within his discussion of the large political and ideological histories of the multicultural education paradigm. He identifies dimensions of MCE that encompass the rich conversations, debates, and actions surrounding the movement, as well as levels of multicultural behavioral competencies within the classroom. Banks' typology can be used as a historical guide through the development of the ideas that construct MCE. Banks, unlike Grant and Sleeter, McCarthy, and McLaren, is not as intent on providing a course of action for multicultural educators as he is on providing a thorough view of the social and historical terrain that produced MCE.

S. Nieto (1992), too, had proposed a more complex design for a multicultural education typology. Her typology is a matrix that identifies characteristics of multicultural education and the levels at which teachers practice them. Both the characteristics and the levels escalate to ideal forms of institutional change to achieve social justice. Interestingly

enough, both Banks and Nieto include student outcomes in their typologies. They provide examples of what the students and teachers should be doing at each stage. In Nieto's case, this is because she uses her typology to inform teacher education in particular. Teachers and teacher educators can use her typology in similar ways that they might use Grant and Sleeter's: to design and implement changes in schools. Lastly, like Grant and Sleeter's work, Nieto's moves along a developmental model, building toward the future ideal.

It is clear that the authors of these typologies, although highlighting various aspects of multicultural education (discourse, content, history, and schooling structures, for example) all use the form of the typology to argue for a kind of multicultural education that realizes the hopes of a democratic and equitable society. Some typologies describe current practices (Gibson), others offer a model along which practitioners can move their practice (Grant and Sleeter, Nieto), while others question the underlying ideologies of multiculturalism itself (McLaren, McCarthy). Since the civil rights movement, the history of education in the United States continues to underscore the belief that public education is one of the primary foundation in realizing the full potential of a just society. Multiculturalism remains, philosophically and in practice, the impetus to achieve this goal.

Thandeka K. Chapman and Nikola Hobbel

DISABILITY STUDIES IN EDUCATION

For most of the history of American education, disabled students were excluded from public schooling. During the early to mid-1800s, some deaf, blind, and "feeble-minded" children and adolescents were schooled in large public institutions that segregated them from mainstream society. Many other disabled young people simply remained at home, receiving no formal education at all.

When the urban public schools of the 1920s and 1930s finally did begin to make provision for disabled students, the field of American special educa-

tion was born. Yet it grew on shaky and slanted ground. From the start, school-based disability was a complex, stigmatizing marker of social identity that mingled together varied dimensions of social identity—race/ethnicity, social class, nationality, and gender. From the very beginning, special education programs were disproportionately filled with immigrant and ethnic-minority boys from working-class homes. The threefold assumption at the birth of American special education was that (1) some students were essentially subnormal, (2) professionals and specialists could use psychological tests and clinical judgment to accurately identify the subnormal students, and (3) the proper place for the education of these students was in segregated classrooms and schools (Chapman 1988; Lazerson 1983).

In 1975, the *Education for All Handicapped Children Act* created a federal mandate that all disabled children and adolescents must be provided a free and appropriate public education. Two distinct historical traditions came together in that Act. The legislation itself was a direct result of the civil rights movement, the 1960s and 1970s struggles for social equality for African Americans, women, and other oppressed groups. Part of that broader struggle was the beginning of the disability rights movement, an identity-based effort on the part of disabled Americans to protest their devaluation and isolation, to claim basic rights such as employment, housing, transportation, and dignity (Scotch 1984). In a profound new way, disabled Americans came together in their own organizations—often called Centers for Independent Living—to reject roles of tragedy, subservience, dependency, and invisibility in favor of the development of a disabled community based on pride, self-reliance, hope, and action (Shapiro 1983).

The second tradition that prospered under the new federal law was the professionalization of disability that had originated in the early special education programs of the Progressive Era (Lazerson 1983). This tradition was heavily steeped in the scientific authority of medicine and psychology (Danforth 1997). Disability was equated with disease, captured in professional concepts of diagnosis, treatment, rehabilitation, and cure (Rioux 1994). Special educators and psychologists relied on systems of intellectual and physical measurement that landscaped humanity across a bell curve, ranking all students on hierarchical frameworks of normality and subnormality, acceptability, and deficiency (Chapman 1988; Gould

1981). Viewed through the objectifying gaze of non-disabled professionals, disability was not about exclusion, oppression, identity, or community. It was about biophysical and social abnormality requiring diagnosis and modification. The professional goal was the normalization of the abnormal.

Over the past thirty years, the education of disabled students in America has remained caught within the tension of these two traditions, between the political concept of an oppressed minority group struggling for human rights and inclusion and a professionalized status as deficient unfortunates requiring treatment and segregation. This tension has been demonstrated in the extended struggle over the inclusion of disabled students in general education programs. Since 1986, when Madeleine Will, Assistant Secretary for the Office of Special Education and Rehabilitation Services in the U.S. Department of Education, issued a challenge to educate students with identified impairments in general education classrooms, educators have battled over the value of the idea that all students should be educated together (e.g., Biklen 1992; Kauffman and Hallahan 1995).

DISABILITY STUDIES IN EDUCATION

Disability Studies in Education rejects the professionalization of disability and the medicalized “personal tragedy model” of disability produced by educational and psychological professionals. It re-engages the purposes and practices of the disability rights movement by espousing a “social model” of disability, an understanding that places primary emphasis on changing the attitudinal and physical features of society so that disabled persons are fully valued, included, employed, and supported. It seeks full citizenship for disabled students within schools and other social organizations, framing the struggle as a project of dramatic social reform rather than an issue of individual modification and conformity (Gartner and Lipsky 1987; Kliever 1998).

Disability Studies in Education is an outgrowth and extension of a larger interdisciplinary tradition of scholarship called Disability Studies. The mainstay of Disability Studies has been a social model of disability that often separates the concept of impairment from the social and political act of disablement. An individual may have an accredited impairment, a biological anomaly or idiosyncrasy that impacts how

that person moves, thinks, or operates within the world. The social model holds that what disables individuals is not an impairment *per se* but the social and environmental barriers that oppress, constrain, isolate, and stigmatize that individual. These barriers include aspects of the built environment such as doorways too narrow for wheelchair passage and buildings without elevators. These barriers include the complex social habits of the cultural environment, the often taken-for-granted attitudes and beliefs about the value and proper place of the disabled person. This includes a general disposition that has been described as ableist, a deep unconscious presumption on the part of nondisabled persons that disabled persons are frightening, ugly, asexual, pitiful, dependent, or invisible. By highlighting the oppressive character of social and political barriers rather than the functional limitations or medical deficiencies of the individual, the social model frames practical action within a political movement seeking rights, equality, and justice (Albrecht, Seelman, and Bury 2001; Barnes, Mercer, and Shakespeare 1991; Barnes, Oliver, and Barton 2002; Davis, 1997).

There are two fairly distinct strands of Disability Studies scholarship that have developed since the 1960s, the United Kingdom version based primarily in a critical sociology of disability and the American humanities version exploring the cultural construction of disability through historical, sociological, and literary scholarship. Each should be viewed as an intellectual project operating in alliance with the grassroots activism of the disability rights movement (USA) or disabled people's movement (UK). Also, each has been deeply influenced by feminist accounts of disability that focus on the experiential standpoint of the disabled person and cultural politics of the body.

In the United Kingdom, the primary strand of Disability Studies scholarship has distilled a historical materialist account of disability. Drawing heavily from Neo-Marxism and Critical Theory, this approach has examined how common constructions of disability as a social problem and personal tragedy are expressions of the Western capitalist economic system. The historical rise of capitalism, and the particular industrial and technological modes of production that have dominated the Western world, have produced an ideology that defines ability/disability within hierarchical, individualized values of efficiency

and market-based competition. Simultaneously, disability has been captured, within institutions of social control and the institutional professions (medicine, psychology), as a social problem that pathologizes and depoliticizes human variation. Within this theory, the oppression of the disabled is a striking demonstration of the political and human implications of a deeply flawed capitalism (Finkelstein 1980; Oliver 1990).

Disability Studies in America has primarily developed a thorough critique of the cultural construction of disability. Historical researchers and literary scholars have led the way in explicating the devaluing and stereotyping cultural images of disabled people within the communications media, the arts, the law, public policy, and other prominent public discourses. Studies have explored the way that historical and contemporary cultural forms and social relations have created and maintained a marginalized status for the disabled. Recent poststructuralist scholarship has focused on the way that representations of the disabled body (and mind) created a hegemony of the normal, an aesthetic and relational ranking scheme that presses disabled persons to the social and economic margins (Davis 1995; Longmore and Umansky 2001; Thomson 1997).

The social model within the United Kingdom and the United States has been challenged and deepened by feminist accounts of disability that spotlight the subjective experience of disability while depicting the human body as a site of political contestation (Morris 1991, 1992; Wendell 1996). These studies critique the social model's usual emphasis on external structures and processes by promoting the experience of disability as a valid source of knowledge and voice within academic research. The general claim is that disabled persons, through the act of living with disability, have privileged access to knowledge about disability. The valuing of an experience-based perspective challenges academic research that often highlights the social processes and political structures that create and maintain social injustice without fully considering the individual interpretations and sensibilities of disabled persons. This challenge has led many disability researchers to develop forms of social inquiry involving close collaborations with disabled persons and the disabled community.

Additionally, feminist studies have examined the social intersection of disability and gender, explor-

ing how the political and cultural meanings projected onto the female body coincide and collude with social representations of the disabled body. The twin oppressions of gender and disability place disabled women in precarious social and economic positions. One goal of feminist research has been to reclaim the body and femininity within a recalibrated scale of value and dignity, pressing for social change and individual esteem in the same identity-based movement (Morris 1991; Morris 1992; Wendell 1996).

Current research in Disability Studies in Education explores the intersections and interplays of disability and gender, race, ethnicity, social class, religion, and sexual orientation in education and teacher education (Brantlinger 2001; Erevelles 2000). Disability is used as a point of entrance into a complex social landscape where numerous group oppressions overlap and the boundaries of numerous social identities often blur. In this sense, Disability Studies in Education is one brand of a host of current strands of critical cultural analyses, often working in alliance with educational subfields such as Multicultural Education, Feminist Studies, Critical Theory/Marxist Studies, and Postmodern Thought.

Within the professional terrain of educational research, Disability Studies in Education serves as a critical counterweight to standard special education constructions of disability, simultaneously critiquing the narrow, diagnosis-and-treatment focus of special education research while expanding disability and schooling scholarship in important new directions. A prolonged and concerted effort has been made to contest the dominant authority of the special education knowledge base that continues to produce the medicalized, personal tragedy account of disability in schools. Working from many philosophical directions, educational theorists have critiqued the hardened circle of positivist disability science that often reduces the voices of disabled students and their families to side chatter beneath the power of the professional account (Heshusius 1982, 1988, 1989; Iano 1986, 1987; Poplin 1987, 1988; Skrtic 1986, 1991).

A simultaneous effort has been made to forcefully articulate and advocate for inclusive education as democratic reform of school and classroom settings, shifting the discourse on inclusion from antiquated goals of normalizing abnormal students toward con-

formity to a social movement to create school environments supporting and valuing all academic citizens. This effort has framed inclusion in general classrooms and buildings as a human right rather than something to be earned through skill development or ability conformity (Ferguson 1995; Gartner and Lipsky 1987; Kliewer 1998; Taylor 1988).

Closely linked to the pro-inclusion literature are explorations of social and political links between the various groups of students that have traditionally experienced exclusion and discrimination within the public schools. This research has focused on the attitudes, political structures, and social practices that have often allocated lesser status and educational provision to students of African American, Latin American, and lower social class backgrounds. Researchers have attempted to unearth the deep and complex relationships between race, social class, and disability within American schools, pressing past the mere acknowledgement that African Americans, Latinos, and working class or poor youth are disproportionately represented in special education programs to examine the historical and sociological roots of political oppression within the schools (Brantlinger 2001; Ferri and Connor, in press; Losen and Orfield 2002).

Supported by the exploration of the segregating and dehumanizing forces within society and schools, advocacy for inclusive education has taken on international dimensions as investigations of inclusion and exclusion have grown around the world. The inclusive schools movement, varying in form and strength across nations and cultures, has become an international phenomenon (Ballard 1999; Booth and Ainscow 1998). Increasingly, researchers are exploring social meanings and policies of disability across cultures, helping bring about a deeper understanding of disability issues around the world while decentering the dominant Western discourse on disability with alternative cultural constructions (Peters and Chimedza 2000). The future of Disability Studies in Education lies in the continuing expansion and deepening of critical cultural analyses to better comprehend and challenge the social, political, and economic barriers to the achievement of inclusion, freedom, and equality of disabled children and adults.

Scot Danforth

FEMINISM AND CROSS CULTURAL FEMINIST ISSUES IN EDUCATION

There has always been “the woman question” in U.S. society. With the dawning of liberty with the abolition of U.S. chattel slavery in the late 1800s, the question of citizenship, and who could be a citizen (with the full rights thereof) became one that fell under considerable scrutiny and debate. As the franchise was being considered for newly emancipated slaves, white women also began to agitate for a voice in the governance of the young nation.

WOMEN’S STUDIES AND WAVES OF FEMINISM

Historically, the activism and examination of issues and events that affect women has been called feminism. The broad field of Women’s Studies, the history of women’s activism, has been conceptualized as happening in three stages: the First Wave, beginning in the late 1800s and ending with the ratification of the nineteenth Amendment to the United States Constitution; the Second Wave, beginning with the “radicalism” of the 1960s and the persistent agitation during the 1970s on behalf of diverse communities of women for rights and opportunities; and, the Third Wave dawning in the late 1980s. It is important to note that these dates are not fixed and easily ratified given that events, people, and ideas are often overlapping. Each “wave” of feminist thought and activism certainly has been appreciably informed and influenced by the period preceding it. Concomitantly, it is conceivable that each wave, in the minds of many, both within and outside of the field, may begin and end in significantly overlapping fashion.

This agitation for rights and opportunities was waged on many fronts. Equal access to education, employment, pay, and equal protection under the law were among the myriad issues that marked the activism of U.S. feminism’s first and second waves. Although all of the issues taken up by first and second wave feminists appear to be universal women’s issues their impact on individual and diverse communities of women varied considerably. The women’s movement and U.S. feminism have been routinely accused of focusing too narrowly on how these is-

ues affect and pertain specifically to middle-class white women.

Women of color argue that race, social class, sexual orientation, and native language all impact these issues in divergent and quite often interlocking ways. Hence, feminists of color have argued that all oppression is not equal.

Much of the early scholarship by First Wave feminists that explored “the Woman’s question” tended to examine women’s intellectual capacity, as it was a commonly held belief, specifically among men, that women, regardless of race, were different from and cognitively less capable than men. Compounding the supposed innate physical and mental differences among men and women was the issue of race. The commonly held belief about black people was that they were innately physically stronger (than whites) and thus “built” for strenuous, manual work. The stereotype that persistently and historically has plagued black women was about their supposed hypersexuality. That is, black women and girls were quite often described as oversexed and promiscuous. They were rarely described as intelligent. Furthermore, terms that denoted the popularly held characterization of womanhood, femininity, ladylike, or even motherly were typically applied to white women. A number of black women spoke out on the inequities of these issues of intellectual ability, promiscuity, motherhood, womanhood, and equal protection under the law between white women and black women. Quite often laws that protected the chastity and overall well being of white women were not applied to black women.

In the field of education, early scholarship tended to critique the differing academic programs of study proscribed for girls and women as compared to that of boys and men. Where boys and men were generally allowed to take a “classical” course of study that included study in Greek, Latin, and French, as well as literature, mathematics, and science, women were consigned to a curriculum that primarily focused on what could be thought of as the “domestic arts.” This domestic arts curriculum differed quite significantly for white and black women and to a certain extent poor, Eastern European immigrants versus middle-class, Anglo Saxon white women. In large part, Eastern European immigrants and black women’s courses of study were comprised primarily of domestic skills, i.e., food preparation, ironing, washing, cleaning, and

so on. For middle-class, Anglo Saxon white women, domestic arts were coupled with a modified classical course of study. The expectation was that an educated middle-class white woman would not go on to advance her studies in a university, but rather be content with managing her husband's household.

Second Wave feminism was part and parcel of a larger movement of change in U.S. society. The Civil Rights Act of 1964 (CRA), which essentially ended de jure racial segregation and oppression, opened the door for other marginalized groups. Among those who were able to successfully add their concerns under the umbrella of the CRA were white women (and other people of color, namely Latinos, Native Americans, and Asian Americans), lesbian, gay, bisexual, and transgender (LGBT) people, as well as the physically and mentally disabled. Given that prior to the CRA, race was more salient in the oppression of most African Americans, the inclusion of gender under the umbrella of the CRA did not necessarily provide added protection for black women that was not already afforded them under protections for race. For example, in order for African American women to seek legal recourse for racial or sexual discrimination, they must first prove that either black men or white women have faced similar discrimination. That is, black women are not part of a protected class separate from either black men or white women. However, the same burden is not held true for black men or white women who seek legal recourse for racial or sexual discrimination (see for example, Kimberlé Crenshaw 1995; Deborah King 1988/1995; Patricia J. Williams 1997; Adrien K. Wing 1997). That is, courts have not allowed black women to argue that they have been discriminated against *because* they are black *and* a woman. Moreover, given that blacks had been granted suffrage with the passage of the Fifteenth Amendment and that women had the right to vote with the ratification of the Nineteenth Amendment, it would seem that black women, were covered by both race *and* gender with respect to the franchise. However, closer examination of both of these issues underscores the precarious position for black women with respect to the right to vote. Under the Fifteenth Amendment, "blacks" had the right to vote, but "women" did not. Would black women, who wanted to exercise their right to vote, be allowed

to vote as "blacks," or denied because they were "women?" Similarly, after 1919, when women were granted the right to vote under the Nineteenth Amendment, was that concession necessarily applicable to black women given that "blacks" had been granted the right to vote nearly fifty years before? It is important to note that prominent white women suffragists opposed the ratification of the Fifteenth Amendment because "women" were not included. Hence, although black women theoretically had the franchise with the passing of both the fifteenth and nineteenth amendments, given their status as *both* "women" and "black," their rights in general and, in this example, their right to vote was not as clear cut as it was for black men and white women.

Educational research that coincided with the Second Wave tended to fall in two camps: liberal feminists and radical feminists. Liberal feminist research generally focused on addressing gender inequality through professional development to raise teachers' awareness of gender discrepancies in pedagogical strategies and curricular options. They also tried to address gender discrimination vis-à-vis school policy and through legislation.

Radical feminist research examined how issues of patriarchy constrain and limit opportunities for women. Radical feminist scholarship called for solutions that sought to address societal norms and belief related to dualisms like power and patriarchy and femininity and masculinity. In addition, radical feminists also sought to address reproductive rights and sexual violence. Moreover, radical feminists looked overall at how the structure of society constrained and limited women's lives. Thus, radical feminist educational scholarship examined the ways that sexual inequality manifested in schooling practices and policies (see, for example, Weiler 1988). Much of this research looked at the social context of schooling that made curricular options and opportunities unavailable to girls. Similarly, some research examined feminist pedagogical practices.

Third Wave feminism, also called "postfeminism" or "neofeminism" has been described as a reaction to the first two waves of feminist theory and activism. Third Wave, or postfeminism has been linked to postmodern theory to the extent that it questions taken-for-granted categories, of equality, privilege, and oppression, and recognizes that these

notions are contextualized and operate quite differently given one's background (i.e., that race, class, and sexual orientation might mediate these issues either to one's advantage or disadvantage). Post-feminists examine patriarchy, critically uncovering the ways that both men and women participate and are oppressed within it.

Within educational research, post- or Third Wave feminist scholars have attempted to make the research process more transparent by addressing issues of objectivity, knowledge, truth, and so on, and exploring the ways that context and positionality shape what we know. Research studies would be qualitative in nature with small sample sizes. For most of this research, the point was not to obtain generalizable results so that strategies could be replicated en masse. Rather, the point was to demonstrate the complexities and nuances of multiple identities, while providing social critique on issues often mediated by race, class, gender, sexual orientation, and other such categories or qualifiers.

It is important to note that feminists of color have attempted to broaden the perspectives on gender and sexual inequality by calling for an examination of context. That is, they have argued that socioeconomic class, marital status, motherhood, race, ethnicity, and native language are contextual and thus mediate the ways in which gender or sexual inequality manifest. In this way, while many women scholars of color have certainly lived and written during the first, second and third waves of feminism, they have not generally been widely recognized as contributing to the first and third waves. A number of Black feminist scholars examined the social construction of gender identity and called for a feminist analysis that takes into account the multiple and complex nature of identity. In this way, we can consider feminists of color as historically and actively participating in all three waves of feminist scholarship and activism.

BLACK FEMINIST THOUGHT

Deborah King (1988/1995), Patricia Hill Collins (1990/2000), Kimberle Crenshaw (1995), and a host of other black feminist scholars have written specifically about the way in which race, class, and gender intersect to shape black women's lives. They further argue that these seemingly competing identities have

quite often worked in concert to oppress and marginalize black women. Thus, the experiences for women of color go beyond the idea that they are simply a person of color plus gender, or a white woman plus skin tone, but that the intersectionality of race, class, gender, ableism, and sexuality speak to the ways in which white male patriarchy, racial oppression, and homophobia work against women of color (Collins 2000 [1990]). A. K. Wing (1997) suggests that black women—regardless of socioeconomic class, sexual orientation, marital status, educational background, and so on—think of themselves, or let others think of them, as the sum of separate parts that can be added together or subtracted from. Rather, she argues that the “layered experience is multiplicative.” Furthermore, Black feminist scholars have begun to uncover how black women have used the marginalized spaces of race, class, and gender as places in which to work toward the liberation of not only themselves, but also *all* black people (Hine 1990, 1998; hooks 1995; Hunter 1997; White, 1999).

Sociologist Patricia Hill Collins (1990/2000) suggests that we can understand Black feminist thought as the nexus of biological classification, the social construction of race and gender, the material conditions accompanying these social constructions and black women's consciousness (p. 22). Further, she suggests that in order to address what she calls the “definitional tensions” of Black feminist thought, it is necessary to first specify the relationship between black women's standpoint and black feminist thought. She describes black women's standpoint as the experiences and ideas shared by African American women that can provide a “unique angle of vision on self, community, and society—and theories that interpret these experiences” (p. 22). Black feminist thought then, “encompasses [the] theoretical interpretations of Black women's reality by those who live it” (p. 22).

In educational research, this examination of Black feminist thought has looked at black women teachers' pedagogical practices and beliefs (Beaubeouf-Lafontant 1997, 2002; Dixson 2003; Foster 1993). Black feminist scholars in education have also sought to explore issues related to subjectivity and positionality when researching black women (Etter-Lewis 1993). Others have examined the ways that Afrocentric feminist epistemology informs the research process (Ladson-Billings 1994). In this way, Black feminist educational research

can be thought of as an example of the post-feminist project of examining the complexity of identity, positionality, objectivity, and research.

It is important to note that attendant to the emergence of Black feminist theories, other women of color have also articulated feminisms informed by their cultural locations. Chicana, Asian, and American Indian feminists have worked along with African American feminists in the quest for equity (Anzaldua 1990; Bernal 1998; James and Busia 1993; Minh-ha 1990). These feminists of color have examined the ways in which nationality, ethnicity, and language can serve as both spaces of marginality and liberation for women of color. As Black feminist research and scholarship has sought to address the multiple layers of identity for black women specifically, but also broadly for all women of color, the projects undertaken by women of color have extended this notion of multiplicity. Specifically, feminists of color have explored issues related to immigrant status, language diversity, and their impact on the lives of women of color.

The future of feminism in education and educational research appears to be bright. Feminists continue to expand the boundaries of what and how scholars know what they know. A more careful consideration of the complexity of identity, subjectivity, and positionality continue to be the focus of much of the new feminist scholarship. Moreover, this work seeks to understand how these issues affect women in particular contexts and seeks to uncover the situatedness of sexual inequality and women's responses and resistances to it. More work is emerging that examines girls' experiences in schools, taking into account the complexity of identities that constrain multiple communities simultaneously (Lei 2003). Moreover, these "new" feminist researchers are able to speak across communities given the focus on the complexity of identity. More and more, scholarship and researchers are seeking to abandon distinct theoretical categories and find ways to work collaboratively. This makes it possible for scholars working across different multicultural traditions (e.g., queer, race, feminism) to find commonalities in each others' work. As such, these collaborative projects enable us to work toward a full realization of liberty and justice for all.

Adrienne D. Dixon

EQUITY AND TECHNOLOGY

Technology has always occupied an important space within the American education system. Serving mainly as an instructional aid for the teacher, technology has varied in form beginning with the blackboard (and textbook) to more advance devices such as the radio, film, television, and videotape recorder (VCR). The introduction of technology to schools in many ways is part of the discussion on the purpose of education. Debates on the purpose of education have varied from socializing students to the cultural values of American society by emphasizing the precepts of democracy (e.g., citizenship); preparation for the workforce; to the development of a "deep understanding of the political, racial, economic, scientific and technological realities that confront the survival" of students of color (Madhubuti 1998, 5). In other words, whatever the purpose of education, technology has served as a mechanism to convey it.

Technology in many ways has been a proxy for how the education system has evolved in the United States. For example, in the 1920s films were introduced to schools as a means to visually bring to life the textbook and classroom discussions. Similarly, in the 1950s supporters of television argued that it could supplement the curriculum, as well as assist the teacher in meeting the instructional needs for an increasing student population (Cuban 1986). During the 1980s, however, schools experienced a paradigm shift with the introduction of computers. Although computers had been in existence since 1945 they were exclusive to the military and commercial sectors of American society (Ceruzzi 2000). Computers now were seen as a way to improve learning and efficiently manage students.

Unlike previous technologies, computers were capable of providing direct individualized instruction and assessing a student's progress without involvement from the teacher (Streibel 1998). For example, with computer tutorials, the student's response determined the next instructional sequence of the lesson. The computer tutorial guided the student through lessons by posing a series of questions one at a time until they have demonstrated mastery of the content. In addition, the skills students acquired from computer usage had been identified as necessary for employment; as well as economic, so-

cial, and civic participation for the twenty-first century. As a result, schools explicitly became the site where students were expected to create, apply, and use information in multiple settings. Thus computers were considered instrumental to the learning process and an indication that students were being provided with a quality education.

As computers became more commonplace in schools and increased in social significance, educational stakeholders (e.g., parents, politicians, business sector) and researchers raised new concerns about equity. For example, in addition to concerns about student achievement, funding disparities and low teacher expectations, stakeholders from historically marginalized groups (e.g., African Americans and Latinos) now had to contend with issues of access (the Digital Divide) and discrepancies in the use of educational technology.

DIGITAL DIVIDE

In 1999, during the Clinton presidency, the U.S. Department of Commerce declared that America had entered the Information Age in which various segments of society, including the entire economy, would rely on digital technologies. That declaration helped to raise the nation's awareness about disparities in access to information technology between the information rich (whites and Asian Americans, individuals with higher education and incomes) and the information poor (African Americans and Latinos, individuals residing in inner-city and rural communities, and those from low socioeconomic backgrounds). The "digital divide" served as a mantra for those concerned with closing the technological gap between communities (and individuals) that could effectively use information technologies such as the Internet and those that could not (Digital Divide Network at www.digitaldividenetwork.org).

Measures to assess and bridge this technology gap began with an examination of the personal ownership patterns of computers between the haves and have-nots. The digital divide's emphasis, however, quickly shifted to education where the distribution of computers was comparatively measured between schools defined along demographic characteristics such as race and socioeconomic status. Subsequently, the digital divide in education illustrated that the unequal distribution of information technologies (computers,

software, email, and the Internet) between public and private schools, urban and suburban (and rural) school districts, and school districts with predominately African American and Latino students versus white student populations was more than a correlation between race and socioeconomic status (Hess 1999). A critical analysis of the digital divide showed how inequities in access to technology were the result of systemic oppression and exclusion of people of color in the United States (Light 2001).

As computers were becoming an ubiquitous feature of schools, critiques by education scholars and researchers began to make connections between issues of access (and use) to systems of oppression and exclusion. Critical education scholars such as: C. A. Bowers (1976, 1988, 2000); Michael W. Apple (1995, 1998a, 1998b); Robert McClintock (1998); Larry Cuban (1986), and many others used various theoretical perspectives (Cultural, Neo-Marxist, Post-Modern, and Ecological) to explain how equity in more qualitative and structural terms were affected by information technology. Unlike quantitative or technical attempts to bridge the digital divide by increasing the computer-to-student ratio, critical scholars in education sought to articulate how biases occurred as a result of adopting these machines. For instance, scholars using a cultural perspective argued that computers and the programs they operated were both ideologically and culturally biased toward Western ideological and epistemological traditions (Bowers 2000). Neo-Marxist and Post-Modern theorists were instrumental in pointing out the role and impact of free market principles and the State in justifying the incorporation of computers in education (Apple 1995, 1998b; Popkewitz 1991). Computers and related information technologies were not objective tools, contrary to their supporters' claims. Instead they were involved in the construction and use of power in terms of what counted as knowledge, how knowledge was constructed, and how knowledge was transmitted (Bromley 1998). In addition, power was also manifested in the physical and programmatic design of computers and software.

The contribution of these nontraditional perspectives of technology continues to be that they provide ways to think about educational equity and technology as more than access to machines. Cultural, Neo-Marxist, Post-Modern, and Ecological

theories of technology in education helped to show those committed to social justice that equity is a complex issue. These critical theories of technology in education however are limited by their inability to address issues of equity specific to people of color. For example, the cultural perspective does not acknowledge that computers could be (and have been) a mechanism that perpetuated existing inequities as a result of varying rates of infusion. In addition, these critical theories have ignored the unique historical experiences that racial groups like African Americans have had with technology (Walton 1999). Interestingly, it was also during the mid-1980s that researchers began to study the educational uses of information technology in schools with large concentrations of students of color, and in schools with a large percentage of students of high socioeconomic status, as a way to speak to these specific issues of equity. Issues specific to technology and equity were expanded to not only address the varying rates of infusion across diverse school settings, they also included examinations of how learning expectations determined the use of computers in the education of students of color.

EDUCATIONAL USES OF COMPUTERS IN DIVERSE SETTINGS

Edmund W. Gordon and Eleanor Armour-Thomas published *Computer Technology and Educational Equity* in 1985, one of the first monographs to report that when access to computers was not the problem inequities existed with the application of these machines. Gordon and Armour-Thomas (1985) found that in poor school districts students from low socioeconomic backgrounds regularly took part in computer-assisted instruction that used drill and practice methods. In middle-class and more affluent schools it was reported that students were more likely to have engaged in more creative and challenging instruction with computers (Gordon and Armour-Thomas 1985). Drill and practice uses of computers were seen as problematic for two reasons. First, drill and practice as a teaching method uses the principle of trial and error instead of directed instruction. Second, the student in this pedagogical approach is positioned as a passive learner and a consumer of information, instead of an active participant in the learning process. Therefore

the student within drill and practice instructional pedagogy is totally dependent on the computer for guidance.

More recent studies on the topic have shown that in predominately African American and Latino settings, schools used computers to develop skills such as pattern recognition through rote memorization. These studies suggested that such skills were required for a compliant workforce and for individuals more likely to occupy service-oriented or low status jobs (Becker and Ravitz 1998). In mostly white schools where the educational uses of computers emphasized creativity, independence, and higher-level thinking skills, it was argued that such instructional practices equipped students with the "social capital" necessary to maintain and reproduce their socioeconomic status (Bourdieu 2000; Persell and Cookson Jr. 1987; Becker and Ravitz 1998).

The findings from studies on the educational uses of technology in diverse school settings have been instrumental in contributing to the expansion of the discourse on equity. In addition to having agreed upon the importance of access to technology, education researchers in this area have sought to examine just-ness of the experiences, relationships, and outcomes that occur because of the machines. Furthermore, these early examinations of the pedagogical uses of information technology in diverse settings have led to the creation of software programs designed to counter cultural biases and low-level instruction. For example, the program Rappin Reader is designed to foster students' language skills so they can become independent readers and writers by engaging in various physical and conceptual settings (Pinkard 2001).

EXPANDING THE DISCOURSE ON EQUITY

The introduction of technology to education has provided new opportunities to think about equity in unique ways. As illustrated by the examination of the digital divide and the pedagogical uses of computers in diverse settings, technology lends itself as a framework to understand both the theoretical and qualitative aspects of what equity is and is not in education. For example, researchers have studied the discrepancies in the educational uses of computers as a means to measure the justness of actions even if they appear

to be in accordance with shared rules (Secada 1989). What are also of import are the theoretical and conceptual linkages that have been established for future scholars and researchers seeking to focus on issues of equity and technology specific to people of color.

Much of what has been written, researched, and discussed about equity and technology in the education of people of color can be traced back to the early part of the twentieth century. The works of Carter G. Woodson (1990) and W. E. B. DuBois (2001) precede the findings put forth by contemporary education researchers in this area of equity and technology. Woodson (1990) was one of the first education scholars/researchers to problematize pedagogical practices such as drill and practice and rote memorization with regards to its relevancy and usefulness to the survival of Americans of African descent. Similarly, DuBois's (2001) critique of the *Hampton Idea* and industrial education's emphasis on teaching skills to make one competent to use machines was that it did not require nor render great intelligence. As technology becomes more established in education, new theoretical perspectives have been introduced to education to include the historical and current collective status of people of color while simultaneously examining the changes caused by technology in order to expand the discourse on equity (Donnor 2003). Like technology, equity is not static.

Jamel K. Donnor

RACE AND EDUCATION

The question of race is at the very heart of U.S. education. It is a perennially salient issue that predates the U. S. Supreme Court's 1896 ruling in *Plessy v. Ferguson* to allow states to maintain "separate but equal" public facilities (Meier, Stewart, and England 1989). For example, the intersection of race and education is evident in 1787 in a supplication made to the Massachusetts state legislature to obtain equal educational rights for the children of black free men. Adult black Bostonians made their case on the grounds that they, like their fellow citizens, shared the burden of supporting the very public schools to which their offspring were being denied access

(Aptheker 1990). Although the request was denied, their petition is a testament to the centrality of race in U.S. education dating back to the colonial period.

The above example also illustrates that even as education is inextricably tied to notions of justice and citizenship, it is also linked to the oppression of subordinated racial groups in the United States. Since the beginning of formal education in the United States a dominant view that citizenship should be limited to free whites informed popular attitudes about the role that education should play in the lives of people of color. For example, the majority of white citizens in the American South believed that educating captive Africans would render them unfit for servitude, making it impossible to retain them as slaves (Woodson 1919). During the same period, tribal school systems administered by white missionaries and buttressed by the *Civilization Fund Act of 1816* sought to abolish the cultures of Native Americans and to replace them with middle class Anglo-American Christian mores, values, and customs (Spring 2004).

Formal efforts to direct the education of people of color in the interests of the dominant white society generally have been countered by grass-roots efforts. For example, by the time that the Freedmen's Bureau Act was passed by Congress in 1865, newly emancipated slaves had already created educational systems for themselves and had reduced the black illiteracy rate by a substantial amount. In addition to literacy instruction, black communities had also developed programs that emphasized a classical liberal curriculum. The words of Richard Wright, a post-Reconstruction Era black educator, illustrate how black educators during this period took up the classical liberal curriculum to advance the cause of equality and, by extension, citizenship and democracy:

It is generally admitted that religion has been a great means of human development and progress, and I think that about all the great religions which have blest this world have come from the colored races—all . . . I believe too, that our methods of alphabetic writing all came from the colored race, and I think the majority of the sciences in their origin have come from the colored races . . . Now I take the testimony of those people who know, and who, I feel are capable of instructing me on this point, and I find them saying that the Egyptians were actually woolly-haired negroes . . . Now,

if that is true, the idea that this negro race is inherently inferior seems to me to be at least a little limping. (quoted in Anderson 1988, 29–30)

Efforts on the part of communities of color to realize an education to best meet their goals during the pre- and post-Civil War periods were largely subverted by both legal and extra-legal efforts by members of the dominant society. As suggested by this brief introduction, conflicting views of the role and purpose of education in minority communities have characterized the nearly four-hundred-year struggle around the meaning of race and education in the United States. On one end of the ideological and programmatic spectrum is the advocacy of an education to extend the practice of freedom and democracy to communities of color; on the other end is the advocacy of an education for minority groups to ensure the maintenance of white supremacy.

THE BROWN RULING AND EDUCATIONAL JUSTICE

Race and education took on distinctive meanings when the Supreme Court rendered its decision in *Brown v. Board of Education of Topeka, Kansas* (hereafter *Brown*). The landmark 1954 ruling provided the legal basis for equal education for all subordinated racial groups. That the *Brown* ruling had implications for extending educational opportunities to groups beyond the black plaintiffs represented in the consolidated cases around which the 1954 ruling was based is illustrated in the 1927 *Gong Lum v. Rice* case (hereafter *Gong Lum*). In this case, the Supreme Court applied the “separate but equal” formulation of *Plessy v. Ferguson* to affirm a Mississippi school district’s decision compelling a Chinese American girl to attend a segregated black school rather than a white school in which her parents tried to enroll her. *Brown* was sweeping in its mandate to shape race and education in the United States and rendered rulings such as *Gong Lum* unconstitutional.

However, the Supreme Court failed to provide clear guidelines to end de jure public school segregation. The imprecision of the Court’s ruling, captured in the order to proceed in the dismantling of segregated schools “with all deliberate speed,” all but guaranteed that the desegregation of public schools would occur at a snail’s pace. For instance, some of the white

communities affected by the ruling attempted to close public schools rather than allow black students to attend them. Others adopted “freedom of choice” plans that permitted students to choose the schools where they wanted to attend. Predictably, freedom of choice plans generally resulted in continued segregation of public educational facilities. Even in instances where authorities attempted in good faith to implement plans to desegregate schools, these efforts were often undermined by state-level action.

As a result of the resistance to the Supreme Court’s 1954 ruling, little dismantling of de jure segregation in public schools occurred during the decade after *Brown*. In addition, *Brown*’s implications for non-southern schools were even less clear. The segregation of schools in non-southern regions of the country occurred as the result of housing patterns that allegedly were not the result of direct state action, although researchers later found evidence that demonstrated the complicity of both local and federal governments in maintaining the color line (e.g., Massey and Denton 1993). It wasn’t until 1973, in *Keyes v. School District of Denver*, that the Court expanded *Brown* to include the dismantling of de facto segregation in public schools.

Despite the often-violent resistance to desegregation, the constitutional impact of *Brown* was enormous and lasting in shaping race and education in the United States. For instance, the Court’s ruling resulted in a dramatic increase in the number of desegregation suits filling lower court dockets. In addition, the *Brown* ruling had extra-legal, or indirect, effects that shaped race and education in the United States, even those that perhaps went beyond the intention of the landmark 1954 decision. In upholding the Equal Protection Clause of the Fourteenth Amendment in its rendering of *Brown*, the Supreme Court largely affirmed civil and political rights, also known as First Generation Rights. At the same time, the ruling was also the impetus for social movements, such as the civil rights movement of the late 1950s and 1960s and Black and Chicano power movements of the mid- to late 1960s and early 1970s. These social movements not only pressed for the implementation of the civil and political rights guaranteed by *Brown*, they also pressed schools to recognize social cultural, and economic rights of minority groups. These latter rights are also called Second Generation Rights. The U.S. Constitution, upon

which court rulings in America are based, largely protects First Generation Rights. The Universal Declaration of Human Rights, about which oppressed racial groups around the world mobilize but to which U.S. courts are not bound, affirms both First and Second Generation Rights.

Thus, despite the resistance of local communities to desegregate public schools, the efforts of various social movements resulted in increased pressures to end segregated educational facilities as well as to change the curricula in these institutions. For example, the civil rights movement created the social milieu for the passage by Congress of both the *Civil Rights Act of 1964* and the *Elementary and Secondary Education Act of 1965*. These legislative mandates paved the way for the 1968 *Green v. County School Board of New Kent County (Virginia)* (hereafter *Green*) court ruling that marked the turning point for the end of de jure segregation and the beginning of the desegregation era. In the *Green* ruling, the Supreme Court held that "freedom of choice" plans implemented by a number of Southern communities were ineffective at dismantling school segregation and set clear guidelines for lower courts to proceed in the desegregation cases brought before them. The guidelines set forth in the *Green* decision became the criteria by which school districts seeking unitary, or desegregated, status were evaluated. These guidelines, known also as the Green factors, included criteria for racial balance and equity in the areas of student assignments, faculty, staff, extracurricular activities, facilities, and transportation.

Brown resulted in the slow but substantial integration of elementary and secondary public schools, especially in the South, as well as in the dramatic increase in the number of students of color in predominately white universities and colleges in the 1970s and the 1980s. The increase in the number of students of color in American colleges and universities also forced substantive changes in the academy as minority students protested the absence of professors of color, the implementation of insensitive and hostile administrative policies, and the use of curricula that either distorted or excluded their historical and cultural experiences in courses that shaped their education. Significantly, Black student movements of the 1960s resulted in the establishment of a Black Studies program at San Francisco State University, the first such program ever instituted at a

college or university in the United States. Similarly, Chicano student movements led to the first Chicano Studies program being established at the California State University at Los Angeles in 1969.

The eruption of ethnic studies programs in American colleges and universities stimulated curricular changes in U.S. public elementary and secondary schools as well. These changes are evident in yearly observances of Black History Month, for example, as well as in the adoption of multicultural curricula in K–12 education. Demands for multicultural elementary and secondary education resulted in changes in the content of textbooks and in how schools and colleges of education certificated teachers and administrators, especially those preparing to work in urban and suburban schools districts with large minority student populations. Race-conscious social movements also contributed to improving the education of students in K–12 education that had been denied access to quality education for reasons that did not have explicit racial overtones. For instance, the *Brown*-inspired *Civil Rights Act of 1964* also opened the door for language-minority students and for students with disabilities to gain greater access to quality schooling.

RACE AND EDUCATION IN POST-CIVIL RIGHTS AMERICA

Federal legal interventions into matters of race and education, such as *Brown*, never fully equalized the resources that students of color received, in terms of either direct student funding or the treatment of students by teachers. Nonetheless, the passage of civil rights legislation and the efforts of race-based social movements resulted in unprecedented gains for members of oppressed racial groups in education and subsequently all areas of society. Access to quality education, for instance, helps individuals gain access to certain types of jobs and is the key to both upward social mobility for members of oppressed racial groups and the ability of these groups to transmit socioeconomic status to their young. A review of the research literature on occupational and adult networks point to the following conclusions that support the contention that educational access translates into social mobility: black students who attend desegregated K–12 schools are more likely than black students in segregated public schools to have desegregated social and

professional networks later in life; desegregated black students are also more likely to work in desegregated settings; and black students who attend desegregated K–12 public schools are more likely to work in lucrative white-collar and professional jobs in the private sector than are their black peers in segregated schools, who are more likely to find work in government and blue-collar jobs (Wells and Crain 1994).

In addition, education is one of the ways that a nation forms its citizens and transmits across generations the rights and duties of citizenship, the basis and rationale of these rights and duties, and the sense of civic responsibility that such obligations entail. The intersection of race and education is especially evident in this sense in the link between Citizenship Schools and the mobilization of the civil rights movement in the South during the 1950s and 1960s (Morris 1984). Education is also a means to change attitudes and to challenge received notions about society. As Justice Sandra Day O'Connor wrote in the majority opinion in *Grutter v. Bollinger* (2003) (hereafter *Grutter*) that upheld affirmative action in higher education admissions, education in diverse settings promotes cross-racial understanding, helps to break down racial stereotypes, and enables students to better understand people of different races. A national Gallup poll conducted in the late 1980s supports O'Connor's contention, finding that a huge majority of Americans (87 percent) believe that the 1954 Supreme Court *Brown* decision that abolished de jure school segregation was correct. This is a sharp increase from 63 percent in support of the decision in the early 1960s and is evidence of the capacity of education in integrated settings to alter public opinions about race relations in the United States (Orfield 1995).

Even as the *Brown* decision contributed to unprecedented improvements in the conditions of racial minorities, it did not completely resolve the four-hundred-year struggle that has shaped questions of race and education in the United States. For example, one result of *Brown* was the massive decline of black educators in teaching and administrative positions in K–12 public schools (Ethridge 1979). In the absence of these educators, many students of color who integrated K–12 public schools often encountered second-generation discrimination and other challenges to obtaining a quality education (Meier, Stewart, and England 1989). For example, *Brown* never challenged the assumption of white supremacy

in society and this omission has had contradictory consequences for students of color in public schools. On the one hand, students of color who exceed the expectations of their white teachers are often regarded as "unusual" and as exceptions to the racial academic norms (Morris and Morris 2002). Autobiographical and ethnographic accounts of race and education indicate that the preferential treatment accorded to successful students of color by their teachers often cause them to be either estranged from or ostracized by their peers. Other studies document the dilemmas of "acting white" and the oppositional attitudes and academic disengagement that constitute part of the legacy of race and education in post-Civil Rights America (Fordham 1996; Ogbu 2003).

On the other hand, from the outset of school integration, black students in the main encountered second-generation discrimination, or the resegregation of students within schools once they were desegregated. Integrated schools typically sort students into homogeneous subsets by ability groupings. This generally results in the concentration of white students in honors and gifted classes and of students of color in lower tracks, remedial courses, and special education programs. Significantly, although disparities in measures of academic attainment between black and white students began to narrow in the 1970s and 1980s, they began to widen in the 1990s and into the first decade of the twenty-first century, resulting in much publicized reports of a "racial achievement gap." Schools also use disciplinary actions, such as suspensions and expulsions, to sort students in ways that reinforce racial disparities in educational attainment. The racial gap in discipline of public school students increased in the late 1990s and the early 2000s as a result of the adoption by districts of zero-tolerance policies to curb real and imagined violence in American schools (Applied Research Center 1998). Widespread reports and highly publicized incidents of the expulsion of black students in the late 1990s refueled concerns in communities of color about educational justice and prompted the prominent civil rights leader the Reverend Jesse Jackson to observe that, with increasing frequency, "school districts [are choosing] penal remedies over educational remedies when it comes to disciplining students" (*Washington Post* 1999, A3).

Finally, despite the gains in school integration in the 1970s and 1980s, public schools have become more segregated in the 1990s and the early years of

the twenty-first century. Urban and fringe city school districts are being populated by increasingly multicultural populations of students of color from working-class and poor families and more affluent suburban schools are being populated by homogeneous bodies of white students from middle-class families (Orfield and Yun 1999). The reversal of school integration is attributable both to failed attempts to integrate schools at the local level as well as to significant Supreme Court rulings, such as *Milliken v. Bradley* (1974), that removed federal courts' power to impose inter-district remedies between cities and surrounding schools to desegregate city schools. Lastly, the resegregation of schools in the 1990s and 2000s occurs within a broader political context of changing public investments where states are increasingly spending more on criminal justice than they are on public education (Zeidenberg and Schiraldi 2002).

RACE AND EDUCATION IN THE TWENTY-FIRST CENTURY

Echoing a view expressed by W. E. B. Du Bois at the beginning of the twentieth century, the eminent American historian John Hope Franklin noted that the problem of race would also be part of the legacy and burden of the twenty-first century (Franklin 1993). Perhaps nowhere is Franklin's observation more evident than in the area of American education. The issue of race and education has resurfaced in the late 1990s and into the new millennium both to unify and to divide Americans. For example, the issue of school privatization has made for strange bedfellows in the political arena where liberal black civic and religious leaders have joined with conservative white politicians and foundations to support the establishment and public funding of vouchers and of privately run charter schools. The same period has also seen the unprecedented inroads made by for-profit educational companies into public schools, especially those with large minority populations. In a similar vein, in higher education, ethnic studies programs have yet to find complete acceptance or legitimacy in colleges and universities. In addition, there have been numerous attempts to dismantle affirmative action gains, with some of these efforts being successful.

At the same time, there is still broad support for

race-conscious educational policies, such as diversity, multiculturalism, bilingual education, and school-funding issues, in the arenas of K–12 schooling and higher education. In addition, despite recent challenges to affirmative action in higher education, a number of colleges and universities and other institutions in the United States have reaffirmed their support for race-conscious educational policies to increase the number of students and faculty members of color in academia. The Supreme Court's preservation of the narrow use of affirmative action in higher education in its 2003 *Grutter v. Bollinger* ruling also lends renewed hope and support for the struggle by oppressed racial groups to obtain educational justice in the United States. However, whether or not such conditions will be realized within the twenty-five-year period expressed by Justice O'Connor in rendering the majority opinion in *Grutter* is one of the central questions confronting race and education in the new millennium.

Garrett Albert Duncan

QUEER STUDIES: SEXUALITY IN EDUCATION

Since the beginning of formal education in colonial America, matters of sexual orientation and gender expression have existed in U.S. schools. Social norms and stereotypes regarding what is "appropriate" or "natural" constantly emerged in school cultures by way of peer interactions (name calling, role playing, dating) and student-teacher interactions (for example, casual references to spouses). Schools often sanctioned or simply failed to challenge such messages, both implicitly through silence and explicitly through policies of who should or should not be hired to teach, how students should or should not behave and dress, and what should or should not be included in the curriculum.

In the early 1900s, a growing number of researchers and theorists turned their attention to sexual orientation and gender expression in schools, primarily in reference to the role of schools in fostering or hindering the development of healthy or socially preferable desires and behaviors among

children and adolescents. These early writings often deemed pathological any deviation among students and faculty from the norms of heterosexuality and of appropriate femininity for females and masculinity for males. Teachers were spotlighted: women teachers (and their teaching of certain subjects) were to be blamed for emasculating male students, and homosexual teachers were to be feared for possibly “contaminating” otherwise heterosexual students (Blount 1996).

The 1970s sparked significant improvements when the political consciousness of mainstream U.S. society, altered by multiple civil rights movements, influenced the ways that the field of educational research addressed sexual and gender differences.

GAY AND LESBIAN STUDIES AND EDUCATION

The deepening political awareness and civil unrest created by the 1960s civil rights and women’s movements helped make possible two historic events for lesbian, gay, bisexual, and transgender (LGBT) people in the United States: the resistance of LGBT people to police harassment at the Stonewall Inn in New York City in 1969 and the American Psychological Association’s decision to declassify homosexuality as a mental illness in 1973. In these events, activists and the medical establishment were asserting that homosexuality should not be pathologized and that homosexuals deserve rights equal to those of heterosexuals, assertions that would fuel the growth of gay and lesbian studies in colleges and universities throughout the 1970s. Gay and lesbian studies produced psychological and sociological research about the experiences of gay and lesbian (and sometimes bisexual and transgender) people and the negative impact of homophobia in their lives, historical and anthropological research about same-sex desire in other cultures and eras, and theories about the normalcy of same-sex desire (Tierney and Dilley 1998).

Within the field of educational research, gay and lesbian studies took longer to emerge than other fields of research within equity studies. A few publications appeared in the 1970s, as did a growing body of feminist studies that would later significantly influence the study of sexual orientation, but it was not until the 1980s that research on gay and lesbian issues in education began to proliferate, especially studies of

schooling at the elementary and secondary levels and studies of masculinity and homophobia. More educational journals and books included articles on the social and academic experiences of gay and lesbian students and the different ways that homophobia manifested in schools, and on the various ways that curriculum could both perpetuate and challenge stereotypes and myths about gay and lesbian people.

In the 1980s, a rapidly emerging national and international epidemic—the spread of HIV/AIDS—became linked with this call to challenge homophobia and to teach students about gay and lesbian people. Initially considered an African and Caribbean disease, AIDS acquired the label of a “gay disease” by people both in and out of the medical profession because, in the United States, it seemed to infect primarily gay and bisexual men. As more schools began teaching about HIV/AIDS (and ways to avoid its infection), more educators found themselves with a politically safe context in which to teach about gay and sometimes lesbian and bisexual people, namely, as the population most associated with AIDS. In fact, health classes, particularly lessons on AIDS and sex education, soon became the most common places to teach about gay and lesbian people. Ironically, while such an approach enabled schools to break the silence surrounding gay and lesbian people, it continued to pathologize them by associating gay and lesbian identities with illness. Thus, in the wake of AIDS, educational research and especially the field of curriculum studies began focusing more attention on how to include or integrate gay and lesbian people and issues across the disciplines, or at least, how to teach about gay and lesbian identities without reducing them to sexual activity, disease, and death (Harbeck 1991).

The difficulties of representing the diversity and complexities of LGBT identities were not easily solvable. Curriculum resources and empirical research—even those produced by LGBT people—came under fire from other LGBT people for failing to address differences (on the basis of, for example, sexual desires, gender identities, and racial and class backgrounds) within their communities and for presuming to know what it meant for all LGBT people to be LGBT. Throughout the 1970s and 1980s, similar criticisms led groups to splinter from larger political and social organizations that failed to address the experiences and needs of subpopulations of LGBT people, including bisexual and

transgender people, women, and people of color. As was happening in women's and civil rights movements across the United States, identity-based political organizing for LGBT people was under fire for operating in contradictory ways, namely, by challenging some forms of oppression and addressing certain populations while overlooking others.

Up through the 1980s, the publishing industry did not make it any easier to print curriculum resources and research that represented the diversity and complexity among LGBT people and issues. Most journals and book publishers had yet to publish any research on such topics, and few editors were openly supportive of doing so. Few researchers could engage in this area of research without fear for their professional, social, or physical well being. Few resources, financial as well as collegial, were available to researchers and curriculum developers (exceptions include the Lesbian and Gay Special Interest Group in the American Educational Research Association, created in 1987). However, times were changing, and as researchers found more opportunities to study LGBT issues, the epistemological landscape was shifting, creating new theoretical lenses for this work.

"QUEER" STUDIES OF EDUCATION

In the late 1980s and early 1990s, postmodern and poststructural theories emerged in the field of educational research and offered alternatives to identity-based political theories and movements. These "post" theories called attention to the situatedness of identity and oppression, that is, on the ways that identity and oppression played out differently in different contexts, and on the ways that embracing differences or challenging oppression required different approaches, depending on the context. "Post" perspectives on LGBT identities made it difficult to say what it meant to challenge the oppression of LGBT people when it was not clear what exactly those identities and oppressions were. Within this paradigm shift emerged "queer studies," a movement that focused less on normalizing LGBT identities and more on examining and contesting the very meanings of normal, including those meanings embraced by LGBT communities (Pinar 1998).

Queer studies of education changed the focus of research and curriculum theory in several ways: (1) from repressing homophobia to unearthing

heteronormativity; (2) from Lesbian/Gay (LG) to Lesbian, Gay, Bisexual, Transgender, Intersex, and Queer (LGBTIQ); and (3) from inclusive curriculums to partial ones. In the first instance, much research from the 1980s and into the early 2000s focused on the dynamics of homophobia in schools, on the experiences of LGBT students with homophobia and, primarily, on ways to reduce homophobia. In contrast, queer studies called on researchers to focus their analysis on the mechanisms that placed value on, normalized, and regulated heterosexuality, especially certain forms of heterosexuality. This shift drew on Michel Foucault's *The History of Sexuality* (published in English in 1978), which argues that what we consider to be abnormal or queer is not merely something that society has repressed, but more importantly, something that society needed and produced. After all, what was normal could not exist without something else being queer, which meant that reducing the marginalization of queer identities could not happen without disrupting the privileging of straight ones (Britzman 1998). Examining the production and regulation of only certain kinds of heterosexual desire had already begun in feminist research on ways that schools privileged and silenced different expressions of sexual desire among adolescent girls and boys. Queer studies in education drew on these studies of sexuality, as well as on psychoanalytic theories of the surprising ways that sexual desire emerged in schools, even among very young children, and even when educators presumed to have kept it out of the classroom.

Queer studies also drew on women's studies and ethnic studies as it raised questions about the ways that even queer identities can normalize other identities. Just as queer studies problematized the notion that hetero identities were more valuable or natural than queer identities, so too did it problematize the notion that certain queer identities (especially gay and lesbian ones) were more valuable or natural than others, including bisexual, transgender, intersexed, and questioning identities (LGBTIQ), as well as identities other than white, male, gender-appropriate, heterosexual, middle-class, able-bodied, and English-speaking. LGBTIQ identities could mean different things when referring to different bodies or in different contexts, and more researchers began to examine differences among LGBTIQ students and teachers and the ways their multiple identities came to bear on their schooling experiences. In the 1990s quantitative and quali-

tative research on the intersections of race and sexuality appeared with increasing frequency, and the first book on race, sexuality, and education was published in 2001 (Kumashiro 2001). More recently, researchers have studied queer educators and different ways of being both “queer” and an “educator” (Evans 2002; Talburt 2000).

The third shift signaled by queer studies is the focus on partial solutions rather than panaceas. For example, some researchers examined the strengths, weaknesses, successes, and failures of various programs and policies (Lipkin 1999). Examples include student “gay-straight alliances” on school campuses, safe-school policies (especially in the wake of costly lawsuits against school districts that failed to protect LGBT students from harassment and violence), and conservative backlashes (such as in New York City in 1991 when opposition to the inclusion of gay- and lesbian-headed families in the multicultural curriculum, “Children of the Rainbow,” sparked intense emotions and controversy). Primarily, researchers have studied curriculum, from problems of existing curriculums and materials to recommendations for curricular change for various age groups in a range of subject matters, including social studies, English literature, health, art, drama, music, and the natural sciences (Letts and Sears 1999). While some of these publications paralleled earlier publications by proposing solutions to the problem of exclusion and stereotypes in curriculums, others drew on queer theory to suggest that different approaches to curriculum revision have different strengths and weaknesses and that even inclusive curriculums can be problematic if they fail to raise questions about what it means to be LGBTIQ or how homophobia and heteronormativity can play out differently for different groups in different contexts (Epstein, O’Flynn, and Telford 2001).

In 2004, queer studies of education continued to raise questions about who was being addressed and what was being taught by schools and by research on schools. Educational researchers were studying populations that had been overlooked by earlier research, including queer students who were transgender, disabled, very young, or were in the process of learning to teach. Researchers were conducting research on different subject matters (including the technological sciences) and ways to teach subjects appropriately to different groups (including young children versus adolescents versus adults). Researchers were

even exploring alternatives to the frameworks that had been taken for granted in gay/lesbian/queer studies. Alternative frameworks included the resilience of LGBTIQ youth (rather than their victimization and harm), the relationships formed among LGBTIQ youth (rather than between LGBTIQ youth and heterosexual youth/educators), and youth with unfixed identities who might be LGBTIQ in some contexts, hetero in others, sometimes for political reasons, sometimes not (rather than youth with presumably stable identities). As more educational researchers come to embrace the impetus behind queer studies, the field of education can expect to continue examining the limitations of what has already been produced, while exploring the changes made possible by frameworks, topics, and questions that have, until now, been deemed too queer for examination.

Kevin K. Kumashiro

CULTURAL IDENTITY

Cultural identity emerges from an individual’s culture and cultural background. While culture is notoriously difficult to define, the most commonly agreed upon definition is that culture encompasses the way of life of a group of people, particularly that of a distinct ethnic group (Eisenhart 2001; Kroeber and Kluckhohn 1952). Under this definition, a culture provides ethnic group members with a framework for perceiving, interpreting, and making sense of the world around them. Cultural identity, then, is the degree to which one identifies with or is knowledgeable about her or his ethnic culture.

Assumptions about the one-to-one relationship between culture and ethnic groups have dominated and continue to dominate U.S. educational practice and policy. At times the distinct cultural identities of individuals and groups in the United States have been seen as threatening and problematic, and have thus led to calls for assimilation. At other times, however, cultural identity has been perceived to be a resource. Viewing cultural identity as a resource has resulted in educational practices and policies that respect, value, and celebrate diverse cultural identities. Since schools have consistently been important sites for debates surrounding cultural identity, we consider how shifting under-

standings of cultural identity have informed educational practice and policy within the United States.

CULTURAL IDENTITY AS THREAT OR RESOURCE

Historically, distinct cultural identities within the United States were viewed as threatening and at odds with a singular national identity. According to this perspective, the path to becoming American required the rejection of native cultures in favor of the mainstream “American” culture (i.e., white, middle class culture) (Gordon 1964). Cultural assimilation was understood to be a prerequisite for socioeconomic assimilation, social mobility, and the successful achievement of the American dream. Failure to assimilate into the dominant culture was thought to be problematic for both the immigrant and the larger society because groups who failed to assimilate were perceived as political, economic, and social threats to the country. This push for Americanization can be seen throughout the history of American schooling, and it continues today in the conversations about the education of newer immigrants and other students of color.

In direct contrast to those who have argued that cultural identity is a threat are those who have understood cultural identity as a resource. Cultural identity has been perceived as a positive asset for both the individual and the national community. At the individual level, healthy psychological development includes an awareness of and appreciation for one’s own cultural identity (Tatum 1997; Cross 1991). And at the societal level, complete and accurate understanding of our history and even contemporary American culture requires knowledge about the diverse groups who make up the United States and the distinct cultures that compose our national culture.

The debate between these understandings of cultural identity as either a threat or a resource is reflected in, and helps shape, various educational practices and policies within the United States. What follows is a review of how particular educational trends and programs—namely the Common School Reform movement, Indian education, culture of poverty theories and programs, cultural difference theories, bilingual education, ethnic studies programs in higher education, and, finally, community-based schools—intersect with shifting understandings of cultural identity.

During the Common School Reform movement, schools were increasingly called upon to solve the perceived social ills that plagued the new republic. Concerns regarding the continuing influx of immigrants from southern and eastern European countries shaped the role of schools throughout the end of the nineteenth century and the beginning of the twentieth century. In particular, it was believed that a distinct ethnic or cultural identity was at odds with a national American identity. Schools, therefore, sought to “Americanize” immigrants through a variety of methods, including “instructing youngsters in middle-class hygiene and manners, diet and food preparation, home management, dress, aesthetic and literary standards, recreation, the rights and duties of citizenship, accentless English, and the myths and legends of U.S. history” (Olneck 2004). By ridding new citizens of their “old world” values, norms, and behaviors, educators played a key role in protecting the legitimacy of the new American cultural identity.

The education of Native Americans during the nineteenth and early twentieth centuries was similarly informed by a desire to strip “Others” of their native cultural identities and assimilate them into the dominant American culture. In 1879, the first off-reservation boarding school was founded in an effort to “kill the Indian, and save the man.” The boarding schools re-educated native children by prohibiting their native languages and spiritual practices, cutting hair, and changing their names and clothes to reflect European norms. During the boarding school movement that lasted from the 1880s to the 1920s, over twenty-five schools in eighteen states “educated” thousands of Indian children through these methods.

In the 1960s the culture of poverty theory gained popularity in educational policy and discourse. According to this perspective, the conditions of poverty lead to a destructive way of life for low-income families and communities (Lewis 1966). Culture of poverty theorists argued that poor and working class children develop problematic cultures—including negative attitudes, values, and behaviors—that make it difficult for them to take advantage of educational opportunities. In response to culture of poverty theorists, educational policies aimed at assimilating poor and working class kids into mainstream middle class culture. Compensatory educational programs (e.g., Upward Bound, Head Start, and A Better Chance)

were designed to teach students to function in mainstream American culture.

During the 1970s educational anthropologists, responding to the perceived ethnocentrism of culture of poverty theories, argued that working class and ethnic cultures were not deficient in comparison to the dominant mainstream (i.e., white, middle class) culture, but simply different. These cultural difference theorists took a cultural relativist position in arguing that all cultures have equal value. They argued that many working-class and ethnic minority children struggled in schools primarily because of cultural mismatches between these students' home cultures and the classroom culture. In particular, these theorists pointed to cultural mismatches related to various ways of speaking, listening, and interacting with authority figures (Hymes 1972; Erickson and Mohatt 1982; Philips 1983; Heath 1983). They were among the first to call for culturally sensitive pedagogy, in which students' cultures were reflected in teaching styles and curriculum. According to cultural difference theorists, therefore, awareness of and attention to cultural identity can result in curricular and pedagogical practices that lead to higher academic achievement among students of color (Au 1980; Erickson and Mohatt, 1982).

Advocates of bilingual education have argued that heritage language is central to cultural identity (Tse 2001; Valdes 2001). Maintenance of the heritage language is understood to be central to academic achievement, family relationships, and an individual's self esteem (Tse 2001). From this perspective, efforts to quickly transition non-native-English-speaking students to English without attention to the maintenance of their native languages are tantamount to subtractive assimilation (Valenzuela 1999).

The development of ethnic studies programs represented an effort to value distinct ethnic groups within higher education. The first ethnic studies programs were developed in the 1960s in response to student demands that their cultures and cultural identities be reflected and respected in institutions of higher education. By focusing on the histories, experiences, and cultures of various ethnic groups in the United States, ethnic studies programs resisted the assimilating discourses of the Eurocentric curriculum.

Community-based education programs such as tribal schools and colleges and Afrocentric schools recognize that students' unique cultural identities

must be fully incorporated into curricula, pedagogies, school organizational structures, and campus climates. In her ethnography of the Rough Rock Demonstration School on the Navajo Reservation, T. McCarty demonstrates how "schools have the potential to silence or give voice to identities rooted and mediated in the local language and culture" (McCarty 2002). Whereas educational programs and practices that perceive cultural identity as a threat tend to silence students' unique identities, community-based schools that view cultural identity as a resource work hard to give voice to those identities in order to provide a more effective and culturally relevant education for all students.

During the 1980s and 1990s, a number of conservative scholars again raised concerns about the impact of cultural diversity on our nation (Hirsch 1987; Bloom 1987; Schlesinger 1992). Rather than emphasizing the value of cultural differences, these scholars and educators have argued for a focus on assimilating all Americans into a common culture. Furthermore, according to this perspective, educational practices that focus on particular cultural groups limit children's sense of and knowledge about our shared national cultural, which in turn impedes effective communication across differences and their ability to participate in our national community. It is argued that America's sense of a shared cultural identity is threatened when teachers and curricula focus on the differences between various cultural identities and ethnic groups. Schools should, therefore, emphasize America's common, shared culture over cultural differences.

The debate over the value over cultural identity continues, with both sides sharing some common assumptions about the nature of culture and cultural identity. Three assumptions that persist within mainstream conversations about cultural identity as either a threat or a resource are: culture equals ethnicity; cultural identities are preexisting given that they arise from one's ethnic background and family; and culture is something located in the racialized Other. Recent scholarship on cultural identity has begun to challenge all of these assumptions.

NEW CONVERSATIONS ABOUT CULTURAL IDENTITY

Recent conversations within cultural anthropology have challenged the one-to-one relationship between

culture and ethnic groups, pointing to variation and fluidity within groups (Abu-Lughod 1991; Clifford 1986). Scholars in the field of education have begun to talk about cultural identities as being “produced” in schools through interactions (Levinson and Holland 1996). From this perspective, students’ cultural identities are not seen as inherent. Instead, cultural identities are understood to be constructed in relationships and, therefore, are always in progress and unpredictable (Eisenhart 2001; Levinson and Holland 1996). Common to the newer conversations around cultural identity is the idea that culture is neither fixed nor simple and thus cannot be reduced to singular or essentialist characterizations.

Scholars in the field of multicultural education have increasingly moved beyond a sole focus on race and ethnicity (Sleeter and Grant 2003; Nieto 2004; Banks 2001). Many now argue that cultural identity includes race, gender, class, ability, religion, sexuality, ability, and other identities. These scholars also draw our attention to the intersection of identities, with the recognition that we all have multiple aspects to our identities.

Scholars writing in the field of critical whiteness studies have argued that most discussions regarding cultural identity have located culture in the racialized or ethnic “Other.” They argue that viewing cultural identity as something located solely in the racialized or ethnic Other leads to the invisibility of whiteness and the belief among white people that they do not have a racial or cultural identity. Research on white youth, for example, has found that the focus on the Other causes white students to simultaneously view racial others as exotic and different and themselves as normal (Perry 2002; Kenny 2000).

It remains to be seen whether and how ideas from the new scholarship on cultural identity will trickle down into the debate among educators and practitioners. If this occurs, the debate will no longer be simply about whether cultural identity is good or bad—that is, whether it is a threat or resource—rather, it will be about how to value the identities students bring with them to school while also recognizing the fluid nature of identities. Furthermore, the differential power and privilege across identities will need to be considered in the development of future educational practices and policies.

Stacey J. Lee and Angelina E. Castagno

CRITICAL PEDAGOGY IN EDUCATION

Critical pedagogy is often misperceived as being a monolithic entity; however, as the vast literature and diverse positions that fall under this rubric indicate, there are a multiplicity of theoretical camps and differences therein and no generic definition can be applied to this term. Even the conceptual descriptors used to map such educational terrain vary: names such as critical literacy, insurgent multiculturalism, critical and resistance multiculturalism, liberatory pedagogy, transgressive pedagogy, and revolutionary critical pedagogy.

Part of the reason for this diversity of labels is that critical pedagogy continues to emerge out of a myriad of intellectual fields of study as well as theoretical and activist voices that are dealing with area-specific circumstances and issues. A brief history of this interdisciplinary unfolding is crucial in order to understand the current concerns and practices of critical educators—that is, the significant theoretical insights and practices that are woven throughout these various concepts, which grow out of, generally speaking, a common set of issues and abusive conditions that provide the focus for critical education within the shifting spheres of political conflict. However, it is important to point out that the following effort to trace these roots is not an attempt to illustrate a fixed, linear sequence of events; many of these theoretical developments are interconnected and reciprocal—or they have occurred simultaneously. It is also important to note that given the brevity of this definition of critical pedagogy, it is impossible to make reference to all of the influential voices and schools of thought that have played a role in its evolution.

Exploring the basic tenets of the work of Karl Marx (1818–1883) offers a great deal of insight into the actual meaning and use of the word “critical.” Marx (1859) was interested in how capitalism structurally divides societies into opposing classes. Within his historical materialist, political economy approach to understanding human existence (i.e., concerns over material conditions, relations of production and distribution, and political regulation), Marx argued that the material foundation of a society—with its fundamental economic structure—

provides a base on which all other elements, which are referred to as the superstructure, can be established: a legal system, political processes and government, religion, aesthetics and art, education, the family, and other cultural practices. From this perspective, social phenomena, including social relations between classes and corresponding forms of social consciousness, have their roots in relations of production and in class conflict. In other words, for Marx the mode of production conditions social, political, and intellectual life.

For Marx, ideology—the ideas of a society that serve to validate the power of the ruling social class, is part of this superstructure. The superstructure is thus complicit in producing what is now often referred to as a “false consciousness” among the proletariat; that is, the point at which members of society are conditioned so as not to be able to read into the ideology that works to exploit them and they consequently become uncritical tools of production and consumption.

Marx’s analysis sparked a great deal of interest in, and ongoing debate over, the relationship among economics, politics, and culture (Althusser 1995; Amin 1998). Influenced by and expanding these debates, Italian theorist Antonio Gramsci (1891–1937) was especially concerned with how the imposition of particular ideologies and forms of authority results in the reproduction—that is, the maintenance—of social and institutional practices through which dominant groups retain not only their positions of privilege and control, but often the consensual support of other members of society—even those most exploited. He referred to this process as hegemony (1971).

Also conducting extensive ideological critique—dialectical social criticism—in order to understand uses and abuses of power so as to be able to transform them was a group of German intellectuals at what became known as the Frankfurt School (Institut für Sozialforschung—the Institute for Social Research), founded at the University of Frankfurt, Germany, in 1923 (Jay 1996). This neo-Marxist think tank was, until 1933 with the rise of Adolph Hitler, the intellectual home for such influential thinkers as Max Horkheimer (1895–1973), Theodor Adorno (1903–1969), and Herbert Marcuse (1898–1979). Their reinventions of Marx into aesthetic and psychological theories and critiques of capitalist culture

became better known as Critical Theory and would profoundly influence the development and direction of critical pedagogy.

Critical social theories were also being expanded and appropriated by anticolonial, antiracist thinkers and activists such as C.L.R. James (1901–1989), Frantz Fanon (1925–1961), Amílcar Cabral (1924–1973), Aimé Césaire (1913–), and Albert Memmi (1920–). These revolutionaries, who were fighting against a long history of global colonialism and white supremacy, understood that economics, politics, and the cultural sphere made up of schools, media, and other public spaces that produce and disseminate knowledge are important forces in maintaining unequal relations of power in society. As clearly expressed in the extensive body of anticolonial work, imperialists have always understood the relationship between knowledge and power and thus how to control the psyche of people, public opinion, and consequently enforce systems of oppression (Fanon 1967; Memmi 1965). These revolutionaries provided theoretical frameworks and practices for confronting the ideologies, authority, and social relations that have driven the oppressive legacy of colonialism and imperialism.

Poststructuralists have also been interested in, and contributed to, understanding the power/knowledge/ideology configuration. By no means a monolithic group, many of these theorists—notably Roland Barthes (1915–1980), Michel Foucault (1926–1984), Pierre Bourdieu (1930–2002), and Jacques Derrida (1930–2004), have argued that consciousness, identities, meaning, and cognitive development are social constructions; that is, they are socially and historically produced within particular economic and institutional conditions and the politics and power relations of everyday life. Their central argument is that systems of communication, which are all social and historical constructions informed by particular ideologies, play a significant role in shaping human sensibilities and subjectivities.

More flexible than Marxist ideas around ideology and consciousness and the structuralist theorists who were in search of universal processes and mechanism that could explain meaning and human behavior in its entirety, the poststructuralists have explored how knowledge and identity are constructed in specific social conditions and relations of power. Of particular importance to Foucault (1972) was discourse.

Rather than relying on the concept of ideology, discourse refers to the way reality is perceived through and shaped by established ways of making sense—that is, languages, systems of meaning, and practices that have been generated in order to sustain particular forms of social existence. However, Foucault was not simply intrigued by what kinds of knowledge exist; he was also engaged in tracing their origins, or what he called “the archeology of knowledge.” Key to Foucault’s analysis was that any consolidation of power is never complete and resistance and opposition are always possible and even probable. Consequently, poststructuralist ideas not only expanded the analytic process of critical inquiry, that is, the taking apart of a phenomenon in order to understand its sociohistorical construction, but also the possibilities of social agency.

Critical pedagogy emerged out of all of these theoretical developments, among others. As the educational arm of critical social theory, it has historically grasped at understanding and responding to oppression, especially as it manifests in formal schooling. The Brazilian adult educator Paulo Freire (1921–1997) has been the most widely recognized and influential theorist and practitioner of critical pedagogy. Freire is perhaps best known for his literacy work in the decolonization process in a number of countries in Latin America, Africa, and Asia, and for his first of many books, *Pedagogy of the Oppressed*, a theoretical guide to revolution published in 1970.

Born in Recife, Brazil, Freire was profoundly influenced by the aforementioned theoretical illuminations and, in addition, the philosophy put forth by George Hegel (1770–1831)—also a major influence on Marx and the Frankfurt School of thought. Hegel’s philosophy works to make reality transparent through the exploration of the interconnecting and contradicting relationships that constitute a particular phenomenon (e.g., an analysis of ‘oppressor’ and ‘oppressed’ holds both opposing concepts together to see how they interconnect and play off each other). Freire was also interested in the phenomenology of Edmund Husserl (1859–1938) that presented questions about the essence of human actions and motives, the sociological and psychoanalytic work of Eric Fromm (1900–1980), and the neo-Marxist ideas of Louis Althusser (1918–1990) and George Lucaks (1885–1971). He was also drawn to the existentialism (in particular the idea that humans can define

and take control of their own lives) of Jean-Paul Sartre (1905–1980), and the insights on popular revolution of Vladimir Lenin (1870–1924), Rosa Luxembour (1870–1919), and Che Guevara (1928–1967). Furthermore, Freire was impressed and motivated by progressive Christian intellectuals, in particular: Jacques Maritain (1882–1973) and his view of knowledge analysis and liberal Christian humanism, the critical voice of Georges Bernanos (1888–1948), the Christian existentialism of Gabriel Marcel (1889–1973), the call of Emmanuel Mounier (1905–1950) for people to take an active role in history, the religious socialism of Reinhold Niebuhr (1892–1971), and the integrative spirit of Dr. Martin Luther King, Jr. (1929–1968).

Spiritually grounded, Freire also maintained reciprocity with Liberation Theology, which emerged in the 1960s out of the economic, political, and military turmoil in Latin America. Gustavo Gutierrez (1928–), the movement’s leading voice, has worked to embrace the idea of a compassionate rather than vengeful God and to answer the divine call to learn from and help the poor and oppressed (Gutierrez 1970). Influenced by critical theory, ecological ethics, and Feminist, Black, and Minjung Theologies, religious practice in this sense includes taking a political stance and opposing the exploitation and tyranny of market forces, thus forging a profound link between Christianity and socialism.

While holding a degree in law, Freire chose to pursue a career in education in Brazil. In the early years, he taught Portuguese in a secondary school, but he soon began to develop, in coordination with the progressive, reform-minded government, adult education, critical literacy classes and programs for the rural poor in his country. Arguing that education is inherently political as it is a site where values, beliefs, and meaning are struggled over, Freire’s model of critical literacy encouraged examination of unequal property relations, the exploitation of labor, and the concomitant class divisions and conflicts that reveal different economic, political, and cultural interests in Brazilian society. For Freire, these structural conditions need to be explored if much of the lived experience of students is to be understood and transformed. But literacy of this sort, he argued, has to begin with where people are and critical pedagogy thus uses generative themes and codes—that is, areas of interest and objects from people’s actual lives

(e.g., a picture of their home in the ghetto)—to begin the journey to becoming literate, politically active, and transformative agents. Needless to say, the idea (let alone the reality) of bringing critical literacy to the oppressed so that they may learn to read and write, develop a public voice, and actively insert themselves into the local and national political process did not go over well with the elite economic powers in the country.

After a military coup in 1964, backed by the United States, Freire was arrested and incarcerated for seventy days for being a “subversive”—that is, for his work with the poor. He was forced to flee Brazil and went to Bolivia for a brief stay, and then on to Chile where he lived for five years working with the government’s adult education program. As a direct consequence of this Freirian-based literacy campaign, Chile was widely recognized, including by the United Nations, for its successes in combating illiteracy.

While the theoretical grounding and implications of Freire’s practices are profound, at the foundation of such work is the conviction that a critical, multicultural democracy should be the driving force in the struggle for freedom. For Freire, conscientization, a sense of history, praxis, and dialogue are central to any such struggle.

Conscientization (i.e., critical consciousness) is the ability to analyze, problematize (pose questions), and affect the sociopolitical, economic, cultural, institutional, and structural realities that shape people’s lives. Achieving this level of consciousness and ability to demystify social reality, according to Freire, requires that people place themselves in history—the assumption being that individuals are never independent of the social and historical forces that surround them as they all inherit beliefs, values, and thus ideologies. In order to be active subjects rather than passive objects that are acted upon, manipulated, and controlled, Freire held that literacy needs to work in a way that helps people read the social world around and within them in order to understand their predicaments, and to deconstruct the meaning on the page and compare it with what’s actually happening in the world so as to avoid ideological manipulation and indoctrination—what he and Donaldo Macedo (Freire and Macedo 1987) have referred to as “reading the word and the world.”

But developing critical consciousness is not just intended for students. First and foremost, any criti-

cal practice includes self-actualization among the teachers themselves. Critical pedagogy calls for educators to examine the ideological posture that they maintain and how it influences the ways that they perceive students and act in the classroom. Teachers are encouraged to compare their values, beliefs, and assumptions with those of the dominant society to see how they may be reproducing discriminatory and exclusionary practices where they work, and in response develop counter-hegemonic strategies that are essential to democratizing schools and ensuring the intellectual growth of all students.

For Freire, the process of self- and social transformation requires praxis. Praxis refers to the ongoing relationship between theoretical understanding and critique of society and action that seeks to transform individuals and their environments. Theory, in this sense, is how people interpret, critique, and draw generalizations about why the social world functions the way it does. From this working definition, theory is the ability to make sense of all levels of the everyday—that is, the *why* and *how* of what has been happening in people’s lives, and not simply a focus on *what* is occurring and how to effectively respond. However, theory for critical pedagogues is understood as being strategic, performative, and directed towards solving important pressing economic, social, and political problems. Arguing that individuals cannot change a given situation simply through awareness or the best of intentions, or through unguided action, Freire contends that people, as active subjects, must continuously move from action to reflection and from reflection upon action to a new action.

Embracing this type of praxis presupposes a reconceptualization of classroom pedagogy. The term pedagogy refers to how people learn what they learn and under what conditions. It is concerned with what is taught (i.e., the curriculum), but more importantly, how it is taught. Critical pedagogy works to reformulate the traditional role of teacher and student in the classroom. Teachers who work within the traditional paradigm, with its model of teacher as knower and students as passive recipients of information, inevitably reproduce and maintain particular forms of identity, meaning, authority, and interaction, often unconsciously. Freire was adamantly against the “banking” model of education, which occurs when teachers perceive students as empty containers that need to be filled with pre-established bodies of

knowledge. In place of this banking model, he offered a problem-posing approach in which students and teachers contextualize and analyze knowledge and its sociohistorical construction. Rejecting the traditional authoritarian role of the teacher, he insisted on creating self-empowering conditions where students take control of their own learning and become knowledge producers rather than uncritical reproducers of existing discourse. To do this, Freire contended that teachers need to become learners, and students need to take the role of teachers so that educators can effectively discover who their students are, what they bring to the learning process, and subsequently what needs to be taught and how.

Freire, who deeply believed that any participatory democracy and critical classroom has to be dialogical, argued that dialogue is not simply another word for a mere conversation among people about everyday matters. Rather, dialogue requires theorizing social reality. At its heart, this type of interactive and theoretical practice is encouraged to facilitate critical discussion and analysis of knowledge and experience that can lead to social awareness, debates over organizational strategies, political innovations, coalition building, and mass citizen actions capable of working towards eradicating oppressive economic, political, and cultural institutions and structures, identities, social practices, public policies, and governments.

Freire's ideas once again played out on the world stage in Nicaragua's struggle for freedom from the dictator Anastasio Somoza, who was eventually overthrown in 1979. The Freirian-based literacy campaign, with its roots in Marxist class analysis, the theoretical forces of anti-imperialist, revolutionary Augusto Sandino (1895–1934), and Liberation Theology, augmented the country's literacy rate from 50 to 90 percent among the general population, and dramatically increased the people's active political participation in public life. This democratic social movement was something that the Reagan administration, with its neoliberal agenda in the 1980s, could not tolerate and it provided the impetus for the U.S. government's Contra-war that was dead set on crushing the Sandinistas that had removed Somoza and won the vote of the people to govern.

Internationally, critical pedagogy steadily began to expand beyond the site of adult education and made its way, though marginally, into K–12 public

schooling, university life, and many other learning environments. Critical literacy also evolved from being a course on learning to read and write to a philosophy intended to inform all educational experiences and engagements with knowledge. Irrespective of the subject matter, the question posed by critical pedagogues remains: Whose values, interpretations, interests, and goals are embedded in the information learners are exposed to and the institutions they inhabit?

The theoretical scope of critical pedagogy also continued to widen. In part this was motivated by the fact that many theorists, educators, and activists were challenging Marxist ideas and the limits of a predominantly class-based approach to critical education. From a post-Marxist perspective, it is argued that such a position disregards the complexities of other interconnecting battles over identity and meaning (Laclau and Mouffe 2001). Influenced by civil rights movements, postmodern theory's expansion of poststructuralist ideas, centered around context and identity (Hutcheon and Natoli 1993), multiculturalism (Goldberg 1995), feminist theory and pedagogy (Meyers 1997; Nicholson 1997), critical race theory (Essed and Goldberg 2001), and queer theory (Abelove, Barale, and Halperin 1993). The foci of critical pedagogy were extended to explicitly include issues of race, gender, ethnicity, nationality, health, religion, language, sexuality, age, and globalization. The word "explicitly" is used here because Freire's work was always concerned with ridding the world of oppression in its many forms, but class analysis was at the forefront of his efforts; especially in his early writings.

Guided by a more elaborated anti-essentialist conception of identity (essentialism embraces a homogenizing view in which categories such as race and gender become gross generalizations about, and single-cause explanations for, individual character), there was renewed recognition of intergroup relations, but also a realization of, and concern for, intragroup diversity and difference. This has major implications for educational practice as such analysis takes into account the specificities and area-specific conditions and experiences that generate different concerns (e.g., women from various world regions frame their predicaments and responses in different ways). However, while difference is acknowledged and respected, there is nonetheless a

movement to formulate more inclusive and effective democratizing networks. Calling for developing alliances across issues and interests, critical pedagogy heartens working towards global coalitions of struggle.

What is important to recognize is that critical pedagogy is not its own universal theory or methodology that transfers neatly from one situation to another. Nor is it meant to be the imposition of a particular ideology. It is an interdisciplinary process that changes—or as Freire often referred to it, is reinvented rather than used as a recipe—with each unique social/classroom context.

As part of its expanding interests, critical pedagogy is increasingly concerned with how pedagogy does not simply take place in formal educational settings and consequently has extended its analyses into the terrain of media, popular culture, and representational politics (that is, who has the power to articulate experience, fashion identities, define the nature of problems, and legitimate solutions). This movement was influenced by the voices of the Frankfurt School and their analysis of what has been referred to as the “culture industry,” and the work of Walter Benjamin (1892–1940). Critical pedagogues also appropriated a great deal of insight from the 1960s political ethos of the Centre for Contemporary Cultural Studies at the University of Birmingham, England (popularly known as the Birmingham School), and the scholars and activists who found refuge there, such as Raymond Williams (1921–1988) and Stuart Hall (1932–). Their constructivist theories—also arguing that reality is socially constructed and thus possible to change—have been primarily occupied with how meaning is produced, circulated, legitimated, and consumed in popular culture.

Tapping cultural studies (Grossberg, Nelson, and Treichler 1991) and postcolonial theory (Ashcroft, Griffiths, and Tiffin 1995), critical educators have been addressing how oppression not only consists of a structural reality built on political and economic processes and relationships, but also relies on symbolic systems to shape the kinds of meaning, identity, desire, and subjectivity that can work to ensure the maintenance of what Gramsci referred to as the hegemony of “common sense” and consent. A full analysis of these symbolic systems includes understanding that the language and images of television,

advertising, radio, print journalism, music, film, and so on, are ideological and formative, rather than merely vehicles for expression or for reflecting reality. Such media are often the conduits through which dominant values and beliefs that work to shape how people see, interpret, and act as socialized and political beings, can be promoted. As an extension of critical pedagogy, critical media literacy encourages theorizing about how popular culture shapes people’s sense of political agency and mediates the relations between everyday struggles and structures of power. The central idea is to get people to not only think about culture politically, but also to think about politics culturally.

The roots of critical pedagogy grew deeper in the United States from the 1980s onward, fed by influential educators such as Miles Horton, Stanley Aronowitz, Henry Giroux, bell hooks, Peter McLaren, Michael Apple, Antonia Darder, and Doug Kellner. They, among many other important figures, have used a critical pedagogical framework to expose Eurocentric curricula in public schools and universities, the harsh and subtle discriminatory conditions that so many students face, and the institutional and everyday constraints that are placed on critical, participatory, democratic life. As part of this critique, they have interrogated how traditional conservative models that dominate mainstream educational programs, which narrowly conceptualize teaching and learning as a discrete and scientific undertaking, embrace depersonalized methods for educating students that often translate into the regulation and standardization of teacher practices and curricula. Critical pedagogues argue that this pedagogical model, which focuses exclusively on preparing students for semi-skilled employment in a now postindustrial society—one that relies on service industries, knowledge production, and information technology rather than industrial manufacturing to generate capital—abstracts education from the challenges of developing a conscious, socially responsible, and politically active student body and citizenry. As such, the larger historical, ideological, economic, and cultural conditions out of which today’s social and institutional crises have grown generally go unquestioned. It is this lack of inquiry, analysis, and agency that a critical philosophy of learning and teaching hopes to reverse.

Critical educators in the United States not only

embrace the postmodern denial of objective inquiry, universal reason, and absolute truth that informs the standardization movement, but they also advance beyond mainstream multicultural education's relativistic affirmation of diversity and into critical analysis of culture and identity. Rather than reduce culture to ahistorical and depoliticized notions of everyday life, critical pedagogy recognizes culture as a terrain of lived experiences and institutional forms organized around diverse elements of pleasure, struggle, and domination—a space that constantly needs to be explored, engaged for its strengths and weaknesses, and renewed.

Critical pedagogy has maintained a theoretical and practical flexibility that safeguards it from imploding into a mechanistic, deterministic movement. The goal has always been to interrogate dominant discourses, confront the oppressive values and beliefs that have come to inform mainstream sociocultural practices, and continuously forge and work to secure economic and political rights within the endless antagonisms that feed the ongoing democratic process.

Pepi Leistyana

CONCEPTIONS OF EQUITY

When speaking or writing about educational equity, researchers, policymakers, and school personnel are usually attending to some combination of the forms of social diversity as found in the nation's schools and districts: that is, gender, ethnicity, race, social class, and language. Typically, such diversity is related to low student achievement on tests, grades, and school attendance. Also, student diversity can be related to differential student opportunity to learn and interventions intended to ameliorate such differences. Often overlooked in much of the literature is that educational policy at all levels, in programs as well as in school and individual practices, are both outcomes of and supporters of deeply held values and beliefs about how one *should* respond to inequality that is related to students' demographic characteristics. These beliefs, values, and associated practices are what is meant by the term "conceptions of equity."

AN EXAMPLE

Consider the following scenario, woven out of my years of working with schools that try to improve instruction for their diverse student populations: School personnel meet to discuss results on the state-mandated assessment. They realize that, once again, the school's low-achieving students tend to be English language learners (ELL) and English-speakers who qualify for free lunch. And, they discuss how the students' performance will affect the school.

While everyone expresses a commitment that *all* students receive an equitable education and the best instruction available, competing beliefs surface among the staff. Some teachers feel that the school's English language learners must learn English *before* they can participate in the school's nascent science program; hence, they argue for reserving the program for its more capable English-speaking students. Others claim that the program's project-based science can develop the students' skills in reading, English language arts, and mathematics; hence, it should be adapted to include ELL students. Still others argue for shifting all content instruction to the school's specialists in teaching ELL students thereby freeing up the regular classroom teachers to teach to the best of their abilities.

Staff also worry about competing policy directives. Bilingual education or sheltered-instruction programs might provide students the opportunities to engage in subjects that require a lot of language without forcing them to compete with their more English-proficient peers, but such programs seem to segregate students.

School personnel voice concerns that the school's low-achieving students might force them to water down their academic programs. The district's standards-based programs lend themselves to combining basic skills instruction with applications, projects, and reading real texts. Will the school's ELL and low-SES students fail in a program that is so heavily dependent on oral language, reading, writing, and student initiative? One teacher notes that small-group time is a favorite among low achievers because they spend so much of it off-task and socializing. Recalling how she had been raised to defer to her teachers for all knowledge in the classroom, another staff member frets about traumatizing students who are not used to the give-and-take that form the essence of the school's standards-based programs.

Everyone agrees that the state tests fail to show the quality of the school's many programs, how hard teachers are trying to teach students, and what students actually can do. Teachers feel pressured to give up valuable class time in order to prepare students to take these tests. All agree that, regardless of their objections, the test results carry great weight in the district, parents are very concerned, and the school needs to do something to raise everyone's achievement. The meeting ends with everyone slightly frustrated at not having solved the problem, but also quite relieved to have finally gotten so many of their concerns out on the table and to start making progress in addressing these issues.

As illustrated above, beliefs about equity surface when people discuss what *should* be done in light of low achievement. For example, beliefs that ELL students need to master English before they can learn content could support a move to providing bilingual or sheltered English instruction or to limiting standards-based instruction to English-proficient students while their ELL peers receive additional English-language training. Yet in light of concerns about student segregation, beliefs that students must master English first could stifle high-quality teaching for all of the school's students.

WHAT IS EQUITY?

Each person above favors equity. No participant would argue against helping their school's low-achieving students do better. What many participants do not realize, however, is that they all hold different beliefs about equity that guide and support what they do in their efforts. In turn, each individual's beliefs about what constitutes equity is supported and challenged by the results of instructional practices, by the school's policies, and by its shared values and dominant ways of thinking and acting.

People who work in the area of educational equity often have major disagreements among themselves concerning goals, the actions that should be taken in achieving those goals, and even the meanings that they attach to the term equity. As a result, they often recommend and take actions that undercut each other, if not work directly at contradictory goals.

There are many different conceptions of what it means to strive for and to achieve equity. Multiple, competing, and even contradictory conceptions can be held by individuals, groups of people, and even

by the same individual. Different conceptions come to the fore depending on the situation that someone faces. What is more, people's efforts to achieve equity are closely tied to the meanings that the term evokes. The following provides an overview for some of the major conceptions of equity, such as caring, socially enlightened self-interest, social justice, equality, representational participation, and as opposed to excellence (or quality).

CARING

As Nel Noddings notes, teaching is a caring profession (1988). Caring—as is the case for all equity meanings—should not be thought of as an either/or choice. That is, it is not the case that someone cares or does not. Nor is it easy to think of someone being committed to equity without also caring about people: Why would someone who does not care about or actively dislikes students of a particular background worry about equity for those students?

The stereotypical secondary teacher who teaches content and does not worry about students' self-concept or feelings is often portrayed as inimical to equity. The lack of caring about students would seem at the base of such a charge.

Many teachers respond to children's real-world situations with empathy and with feelings of nurturance. Think of the staff member, above, who recalled her deferential treatment of her own teachers and her concern about causing trauma to students.

At an extreme of caring are teachers who avoid all risk of adding trauma to their children's lives. Such people seem to believe that some students face such challenging everyday lives that the academic (or other) demands of formal schooling might prove too much for them to handle. Hence, the goal of schooling should be to provide a safe haven for such students. If one visits these schools and such teacher's classrooms, they are very safe places emotionally.

Hence, caring about students' emotional and social well-being could result in an overly protective environment where students are not challenged to use their minds, to think, and to respond critically. Children would fail to learn very much in such settings. Caring was used to deny students opportunity to learn.

On the other hand, caring could be used to motivate proactive interventions. Successful teachers care that their students learn to use their minds. Their

caring for their students extends beyond the social and emotional to include the intellectual. They challenge their students and support their students in meeting those challenges. The media's image of Jaime Escalante's instructional methods, the Latino teacher portrayed in the film, *Stand and Deliver*, who helps his Latino students to pass an advance placement calculus test to the amazement of the test officials, is tied as much to his passionate caring for his students' success (as seen in how he exhorted them to succeed) as it is to any particular instructional strategies that he may have used.

SOCIALLY ENLIGHTENED SELF-INTEREST

When equity is portrayed as a form of socially enlightened self-interest, people argue that all students need to achieve because it is in society's self-interest that they do so. Education is an investment in the development of future adults' intellectual competence and in the socialization of people into the common language and norms of a society. Education is an investment so that future adults will vote intelligently, work in well-paying jobs, and serve in an increasingly technically demanding military. Underachievement is a threat to this investment since undereducated citizens do not have the necessary social networks, nor the proper knowledge, skills, and dispositions to participate fully in society.

Equity as socially enlightened self-interest can be traced to four developments. First, American society has been undergoing a dramatic shift so that the American school-age population is more ethnically and linguistically diverse (in both absolute numbers and proportional makeup) than at any other time in its history. Second, this growth has been in those groups of students who have been—and continue to be—undereducated relative to their peers. Third, the requirement for a highly educated, technically skilled, and socially adept populace has been accelerating and has placed additional pressures on the educational system to increase its academic and social demands on students. Fourth, failure to educate students who in the past were written off—such as the poor, non-white ethnics, non-English-speaking students—portends threats to the political, economic, social, and military fabrics of American society.

Concerns about America's changing demograph-

ics and its economic, military, and development needs often are expressed by business and the military. They provide rationales as regards equity that are very compelling to federal and state legislatures, educational agencies at all levels, and the general public. Professional organizations have invoked self-interest as a reason for justifying reforms and efforts for ensuring that all students are better taught.

In the above vignette, school staff who feel pressure to raise the accomplishments of their low-achieving students and act accordingly might be motivated by enlightened self interest; it is in the school's best interests for its students to improve. Additionally, staff who take to heart exhortations to increase the number of literate adults because it benefits the larger society are responding on behalf of society's self interests.

Socially enlightened self-interest need not always be altruistic. There are other solutions to the need for a highly educated citizenry. Business can seek a well-educated work force from other sources. American immigration policy has been reformed to allow (if not to encourage) the immigration of highly educated people from other countries, especially people with technical skills. While society takes steps to educate everyone, it also hedges its bets by ensuring a steady supply of such individuals through other vehicles.

SOCIAL JUSTICE

When people use the term "equity" in everyday parlance, they often mean that something is fair as in the expression "fair and equitable." What is inequitable is, thus, unfair.

The general treatment of America's first peoples, slaves, women, poor, original Latino/a settlers of California, Texas, and the Southwest, and of other groups provides, at best, a mixed history. The historical denial of educational opportunity is but one in a long list of injustices that have been visited on the original members of these groups and their descendants. Depending on one's stance about American history, equity demands some forms of specialized opportunity as a means of (1) compensating for the larger social injustices visited on members of these groups (such as segregated housing, unacceptably low job opportunities, poor health care, discrimination in voting and other forms of social participation);

(2) compensating for the more-narrowly defined denial of educational opportunity; and/or (3) dismantling the social structures that continue to impact on the lives of members of these groups.

In addition to thinking about equity in terms of compensating people for unfair (or unjust) treatment, equity also provides a rationale for taking action that avoids something that might be unfair. While compensation often comes after the fact, avoidance focuses on “before.”

For example, school personnel might argue that the outcome of not teaching English language learners in mainstream settings would be unfair since these students’ later-life employment opportunities would become limited to low-paying fields through no fault of their own. In some cases, school personnel might find that certain practices—for example, not allowing students to take courses because they did not speak “adequate” English—were school-based barriers to student’s learning. Appeals to equity as social justice could motivate removing barriers and taking action to help students who had been denied the opportunity to learn so that they can catch up to their peers.

Alternatively, a school’s staff might determine that something that they were planning on doing would severely curtail, if not totally eliminate, opportunities for students to learn. Equity as social justice could motivate efforts that would stop such a policy from taking place.

Current-day educational practices that are hotly debated as being unfair include tracking, high-stakes testing, and other procedures that have impacts on the life chances of students. Insofar as ideas of social justice evolve and change, people’s standards for educational equity will also evolve and change.

Schools are pressured by interest groups who advocate for programs and specialized services for their children as a matter of fairness. Parents of children who are usually successful in conventional programs might argue that a switch to a standards-based program is unfair to their children because it disadvantages them relative to others. Parents of low-achieving students might object to a program for similar reasons. School personnel might ask how fair it is to place ELL students in a science program that depends heavily on competence in English.

On the other hand, school personnel could argue

in favor of changing the school’s curriculum and materials on grounds that a conventional program has unfairly penalized low-achieving students. Tracking and other ability-grouping systems are said to unfairly limit the quality of instruction that students who are at the very bottom tracks receive. Hence, detracking and alternative instructional strategies would become matters of social justice.

Ideas of social justice always bubble beneath the surface in meetings such as the above. A great deal of mutual trust and the development of a safe working environment are necessary before teachers and other school personnel are willing to risk the kinds of arguments and misunderstandings that come about when people try to make clear their ideas of what is fair and what is not. Such conversations become even more difficult when school staff represent various ethnic groups.

EQUALITY

Until the recent past, most non-American writers have tended to write about equality and inequality, not about equity, as it applies to groups. These writers are interested in whether or not differences can be found among groups based on social-demographic characteristics such as gender, race, ethnicity, social class, and language proficiency. Most reports that find differences in achievement focus on differences among these groups.

Educators and policymakers are rightly interested in whether learning, achievement, and persistence in course taking are distributed among this nation’s socially identifiable groups. If between-group differences are found, then they try to understand how those differences came to be, other relevant characteristics, and what might be done to diminish them.

Two points are worth remembering when thinking about group-based differences. First, “equality” and “inequality” are not based on the individual case. These terms have statistical meanings that are based on groups and on their compositions as social constructions. As a colleague of mine once said, these groups may be socially constructed, but consequences of membership are no less real for their members.

A second point is that not all inequalities are unfair. In other words, it is possible to do inequality-based research without worrying about equity. People vary in height, weight, skin and eye color, and other

traits; inequality on these traits need not always be a matter of social justice or fairness. At a minimum, there would have to be some evidence that social mechanisms are creating those inequalities. Also, there would need to be some additional criteria for arguing that, even in the presence of social mechanisms, a particular inequality among groups is inequitable. For example, all other things being equal, schools spend proportionally more money educating students with physical disabilities than they do in educating children without those disabilities; I know of no one who would claim that such an inequality (in expenditures) is inequitable. To the best of my knowledge, the explicit determination of criteria by which an inequality can be called unfair has not been deeply considered in the literature on equity in education.

In the vignette above, the fact that the school's English language learners—as a group—perform less well than its English-proficient population has given rise to concerns about how well the school's new science program will serve their needs. That attention has been called to these group-based differences could also create the felt need, within the school, to determine the mechanisms by which they occur. As also evidenced above, school personnel propose many different possible mechanisms. Once their attention has been called to such group differences, the next challenge for most schools is to develop means to resolve them. In the vignette above, for example, school personnel suggested that one possible explanation was the test's failure to align with their intents and efforts. The next step would be to review the test's content emphases and to see how well they matched what was being taught. Also, someone might consider how well the school's curricular tasks and the tasks' requirements for good and/or right answers align with the tasks found on the test. Once school personnel had developed some agreement about what is blocking their ELL students' learning, they could then take steps to overcome that interference. Similar efforts could be taken in the case of other purported mechanisms.

REPRESENTATION

How women, people of color, and members of other underrepresented groups are portrayed and whether

or not they appear in a wide range of social settings (for example, committees working on the development of policy), positions of authority, and media representations (for example, pictures in books, movies, and television shows) has become a matter of equity. In this conception of equity, people worry about the perpetuation of stereotypes through the absence or through the active construction of images, behaviors, and traits that link members of different social groups to antisocial or pro-social settings.

A common criticism of American school texts is that although females are now presented in jobs and roles that were previously reserved for males, males are not portrayed in nontraditional roles. Another common criticism of television and movies is that minorities are often relegated to secondary roles, portrayed in negative ways, and stereotypically treated. In its *Brown vs. Board of Education* decision, the United States Supreme Court's famous footnote 11 cited studies that demonstrated how the lack of role models for success—that is, the nonrepresentation of African American success—was detrimental to children's psychological well being. On these grounds, the Court rejected earlier decisions by its predecessors accepting the practice of segregation.

People who view equity as a matter of representation often demand democratic participation by members of underrepresented groups on committees. Their reasoning is that these individuals will serve as the voice of the group on those committees and help to ensure that their group's interests are protected.

Consider the vignette above. If teachers of ELL students or meeting participants did not include representatives of the same ethnic backgrounds as students, the committee's ability to represent the concerns and interests of such students would have been open to criticism. Likewise, a committee reviewing curriculum materials to be used in the school would likely look for examples of successful male and female scientists from a range of ethnic and social backgrounds. They would try to ensure that the interests of their diverse students, including the English language learners, were represented in those materials. And they would try to ensure that the settings did not create or reinforce stereotypes of populations.

Representation-based efforts can result in the cre-

ation of different kinds of stereotypes. In efforts to represent different groups and to incorporate content that may interest students from such groups, curriculum developers will sometimes water down the content so that, for instance, a difficult idea gets treated in a superficial manner. Both student interest and understanding suffer. People's accomplishments might be mentioned in passing or their accomplishments might be misrepresented because the materials failed to take the needed time to develop things more fully. Finally in the name of representation, curricular materials will often use stereotypical names—such as Maria or Jawan—and physical features exclusively in order to signal a student's race or ethnicity, thereby ignoring that names like Michael (Jordan), Jennifer (Lopez), Kristi (Yamaguchi), and Tiger (Woods) are perfectly good names for representing people of diverse ethnic and linguistic backgrounds.

OPPOSED TO EXCELLENCE

Many parents, policymakers, and even school personnel are concerned that efforts to include heretofore excluded students will be done at the expense of rigorous academic standards. Critics of affirmative action and other efforts to achieve equity have asked the rhetorically loaded question as to whether equity is to be found in the direction of watered-down academic standards or in insisting that low-achieving students meet enhanced course-taking requirements for graduation.

Even a cursory reading of reform documents reveals that there are many reasons for modifying school programs, such as the need to cover new content that better reflects recent developments in a field, or the teaching of a subject so as to be developmentally appropriate, or the shifting of instruction from a focus on rote memorization to a focus on understanding basic principles, or the teaching of a subject so that it better mirrors how that academic discipline actually is practiced. Regardless of these reasons, when someone proposes that an additional reason for modifying a program might be to increase the participation of a school's low achievers, people begin to worry about watered down curriculum.

In the above vignette, when school staff expressed concerns about sacrificing rigor or watering down

the content, they were expressing fears that equity might be opposed to excellence. Another way of thinking about equity would be to argue that equity means both: maintaining rigorous standards and ensuring access to that content for all students.

When I first began work in this field nearly two decades ago, I thought that equity could easily be tied to ideas of social justice. Over the years, I have come to realize that equity cannot be reduced to any single dimension. First of all, a reductionist stance can place someone in an untenable position. For example, if equity is simply a matter of equality, one way of achieving it is to deny a particular good (for example, access to a particular course) to everyone; yet I certainly would not accept such a solution. Secondly, people in education and in the larger society accept different conceptions of equity, often at the same time. If individuals want to make progress in the larger society, then they must consider how their efforts address these multiple conceptions.

That equity cannot (or maybe, should not) be reduced to a single construct does not mean that people cannot strive for some clarity in their own ideas and work. Educators need to better understand the above conceptions and how they interact with each other. For example, the interaction between social justice and equality would seem to be the reason that not all inequality is inequitable. One needs some principled means for deciding if a particular distributive scheme is unfair. Likewise, if there is social agreement that how something is distributed is a matter of social justice, then equality-based research would need to be carried out in order to determine whether the initial inequity had been corrected.

Finally, notions of equity will continue to change and evolve. As ideas of social justice have changed, so too have ideas of equity. Practices and social arrangements that might seem fair to one generation may become striking (or even, outrageous) exemplars of inequity to later generations—consider, for example, how the voyage of Columbus, the institution of slavery, and the status of women have been reinterpreted over the past decades. Likewise, as new social-demographic groups come into being, as their educational concerns and political demands come to the fore, and as old groups shrink away, the substantive concerns for equity will morph and change.

Walter G. Secada

MULTIRACIAL EXPERIENCES

For 2000, the U.S. Census Bureau created a “check all that apply” measure for race. This was a compromise, for some wanted no change, others a separate multiracial box. Ultimately, the anticipated change was muddled in a controversy revealing how institutionalized certain views of race have become. When increasing numbers of people failed to see themselves reflected in conventional racial groupings, they sought a remedy. The census compromise does not end their search for validation and identity.

With time, race and race mixing have become ever more complex. Throughout American history the products of interracial sexual unions have created a dilemma for the racial system of sorting people into dichotomies, either/or, bipolar schemes. This system has sustained the belief that group membership is exclusive—that each of us for social and political purposes is a member of one *or* another racial group. Historically the term mixed race referred to black-white fusions that were seen as part of a two-tiered system with multiracial people in between, but still black. Trying to create a mixed-racial category in the census is an attempt to move away from the either/or nature of racial group membership, and codify the experience that many people are simultaneous members of multiple racial groups (Thornton 2004). However, the group they attempt to codify is extremely diverse.

The complexity of race mixing in the United States can be seen in the 2000 Census data (American Demographics 2002). Despite a belief that the new format would siphon members away from the traditional racial categories and as such dilute their power, only 2.4 percent of Americans identified themselves as having a multiple racial heritage. Of that number, 93.3 percent identified themselves as biracial. The largest group of multiracials (32.3 percent) was white and “some other race,” which is most likely Latino/white, followed by American Indian (15.9 percent of all multiracials), Asian/white (12.7 percent), black/white (11.5 percent), and some other race/black (6.1 percent). Other groupings, such as Asian/some other race and black/American Indian appear much less often. About 72 percent of those identifying a multiple heritage claim partial white ancestry.

Multiracials cluster along the west coast (e.g., California, Nevada, Washington), the southwest (e.g.,

Texas, Oklahoma, Arizona) and New York. They appear most often in cities such as Oakland, Sacramento, Los Angeles, San Francisco, Riverside, and San Jose, all in California. About 4.6 percent of all multiracials live in New York City, and 3 percent to 4 percent live in places like Las Vegas, Oklahoma City, Miami, San Antonio, and Denver. The majority are 24 years of age or younger, most being 5 to 24, followed by those who are 35–54 years of age.

While these data provides us with a contour of multiracial American life, it is much more difficult to describe the quality and the specifics of their lives. This is in part due to several time lags: research had until the 1980s highlighted black/white mixes, supplanted by a recent focus on Asian/white mixes, all of which typically investigate ethnic identity to the exclusion of mundane aspects of life, such as being a sister, a parent, from a working class background, and so on. Because most popular discussions fixate on white/other combinations, we also know little about people who identify with more than two racial groups or about minority/minority mixes.

MULTIRACIAL IDENTITY AND DEVELOPMENT

In part because multiracial people remain relatively uncommon, attention focuses on comparing them to the mainstream, particularly their identity. Research on multiracials suggests that they have a different flavor to their lives when compared to so-called monoracial people (Nakashima 1996; Newsome 2001; Thornton 1983; Root 1996; Harris and Sim 2002). While with whom multiracials identify spans a range of possibilities (Gillem, Kohn, and Throne 2001; Rockquemore and Brunsma 2002), a still-popular presumption is that they are a population at risk, face special and unique problems, and are socially and geographically isolated (Herring 1995; Piskacek and Golub 1973; Gaskins 1999; Brown 1995; Kerwin and Ponterrotto 1995). Typically, this research examines mental health patients or those linked to social service agencies (e.g., Gibbs and Moskowitz-Sweet 1991; McKelvey, Mao, and Webb 1993).

Even so, some analyses of nationally representative survey data find significant mental health differences between multiracial and monoracial adolescents, although it is unclear if multiple heritage is the specific reason for the difference. S. Milan

and M. K. Keiley (2000) found that racial minorities and multiracial adolescents reported far higher levels of depression than did their majority counterparts. In contrast, T. Cooney and M. Radina (2000) note higher rates of depression only among multiracial and monoracial minority females. J. R. Udry et al. (2003) learned that mixed-race adolescents are at higher health and behavioral risks than those who are single-raced. White/Asians were notably more likely to consider suicide, be suspended, and repeat a grade. It is of note, however, that Udry et al. found most mixed-race adolescents are at low risk.

Other work suggests that multiple racial heritage may be no more risky than a single one. Cooney and Radina (2000) checked delinquency rates and academic performance and noted no significant differences between multiracials and monoracials. A. Beal et al. (2001) found nothing among seventh graders to distinguish single-raced adolescents from their multiracial counterparts. Others describe more similarities than differences. K. Grove (1991) found comparable identity statuses for Asian American/whites, Asian Americans, and whites. Even so multiracials saw race as less important than did Asian Americans; they struggled with being bicultural and were often unclear where they fit in racially. The nature of this struggle, R. Johnson and C. Nagoshi (1986) found, may vary by gender. Biracial males revealed higher socially desirable traits than other males, while biracial females were more extroverted than monoracial females.

When notable differences arise, they may be attributed to context, and much less clearly to racial status (Jacobs 1992). For example, biracial children often appear in the child welfare system in part because they experience discrimination from extended family members and have mothers expressing mixed feelings about them (Folarnon and Hess 1993). Other work reveals that multiracials, compared to their monoracial counterparts, are similar in life stress, self-worth and levels of alienation but have less restrictive mothers. Multiracials having healthy self-esteem may come from families with the most social class and emotional resources (Cauce et al. 1992; Gibbs and Hines 1992; Kerwin et al. 1993).

There is another research tradition (known as the variant approach; see Thornton and Wason 1996) that highlights unique identities, healthy and no less intrinsically valid than any other. Much of this work

is conducted by multiracial researchers or members of multiracial families. Some of it points to multiracials having higher self-esteem when compared to monoracial counterparts (Chang 1974; Field 1996; Phinney and Alipuria 1996). Others point to similar early stages but major differences in the final stages of development (Kich 1992), or that development varies even within specific racial mixtures (Stephan 1992). W. Stephan and C. Stephan (1989, 1991) found that most multiracials identified with several groups, suffered no ill effects, were tolerant of other groups, displayed a language facility, and enjoyed the cultures of the groups that were part of their heritage. M. Thornton and H. Gates (2001) revealed that among black/Japanese, identifying with both parental groups varied along a continuum, from those who were adverse/neutral to both, embraced both, or created a new multiethnic identity.

With increased visibility, examination of multiracial consciousness and identity has expanded tremendously. Still, the discussion remains limited. Since most interest originates in the effects of crossing racial boundaries, not surprisingly, most studies address how multiracials are either different (for good or for bad) or argue that they are like anyone else—ultimately, the essential quality of their lives is seen to embody the good and the bad of race relations. Thus the focus on racial identity, a trend especially among newer work, where the discussion is often a personal one.

Aside from ignoring the more mundane aspects of life (e.g., such as multiracial familial or political attitudes), this literature rarely interrogates the racial meanings that pervade the various racial mixes involved (for exceptions see Williams-Leon and Nakashima 2001; Comas-Diaz 1996; Hall 1980; Williams and Thornton 1998). An important task is to deconstruct multiraciality and examine the meanings that correspond to specific types of racial categories, identities, and mixtures. New work on multiraciality needs to be attentive to the issue of power as deployed in different levels and sites of social life (Omi 2001, ix-x). This includes acknowledging and assessing the power to identify oneself, to define and establish categories, to promote cultural representations and to advance political claims effectively. These all will help us understand the full range of multiracial experiences.

This clarion call to explore “notions of boundary-

creation, boundary-bursting and boundary-expansion" (Houston and Williams 1997, ix), is important, particularly so because the trend thus far has been to recreate the traditional race relations literature in miniature for multiracials: race relations are dichotomous associations between whites and others in this literature, between whites and Asian Americans or blacks. The literature fails to recognize multiracial households created by nonwhite counterparts. We need to move beyond black/white and Asian/white. When speaking of Asian Americans, for example, Y. Espiritu notes, "It is . . . critical to move beyond the 'white-yellow' axis and recognize the multiracial households created by Asians and their 'non-white' partners" (2001, 26). We have ignored this kind of dimension because the minority/minority divide does not threaten the border between whites and nonwhites (Root 1992).

The trend to highlight white/Asian American mixes, and ignore Asian American/minority issues is also related to biases within Asian American communities. Paul Spickard suggests, "Upholding the myth of ethnic and racial purity, the Asian American community has been as guilty 'of stereotyping and oppressing, of mythologizing and dominating' Asian-descent multiracials as has white America" (1997, 45). Although the exclusion of multiracial Asians is often couched in racial terms, their treatment has not been uniform but instead varies according to the racial derivation, class background, and gender of the multiracial person. Replicating the hierarchical American racial system, Asian American groups are least accepting of Asian-descent multiracials who are of African heritage. As Houston and Williams (1997, vii) state, the product of the interracial union is "considered even more frightening if its multiracial composition includes African ancestry." As Espiritu writes in a different way, "this hostility toward Afro-Asians reproduces U.S. racial rankings that place African Americans—and therefore multiracials of African heritage—at the bottom of the social scale" (2001, 28). Paul Spickard (1997, 55) contends that only in rare instances of famous achievements "are Asian communities willing to treat mixed people of African American parentage as insiders" (e.g., Tiger Woods).

While I have highlighted the need to interrogate multiracial experiences along multiple dimensions of race, there remain other important aspects to the lived experiences among multiracials that are ignored, such

as the roles of social class and gender. Until research begins to reflect the full range of multiracial experiences, our vision will remain myopic and driven by political and social agendas that say more about us as a society than about multiracials as living and breathing beings.

The process of developing an identity is complex for multiracial youth, especially since there is no single multiracial identity. Finding a personal and family identity that represents their own attitudes about being of multiple ethnic/racial heritage is complicated by social forces which push them to identify with one group and even preference one over another race. In a real sense, they have many options, yet they are rarely encouraged to embrace them all. For educators, counselors, and others concerned with their welfare, learning about and respecting the beliefs, attitudes, and concerns of multiracial families is crucial. Paramount in this is an understanding that there is no one right answer to identity. We must support them in exploring the full sense of who they are and want to be. Only in this way may we help them understand how race is only one small aspect of who they are. We as a society are the problem, for we have only begun to appreciate the notion that we are all multiracial in a biological sense; we remain fixated on seeing the world as black *or* white *or* Asian *or* . . . fill in the blank.

Michael C. Thornton

HOME AND SCHOOL RELATIONS

This entry summarizes the history of and contemporary emphasis on home-community and school relations, with special focus on parent participation or involvement. Such participation is now widely considered an essential and necessary element in any school reform or improvement effort, particularly in relation to increased student achievement and success (Hidalgo, Siu, and Epstein 2004). The literature connecting parent involvement to student achievement is extensive, and will not be reviewed here (see, e.g., Desimone 1999). Suffice it to say that different types of parent-school involvement have been associated with increased student achievement. However, as Desimone points out, "despite the sizable amount

of research relating different types of parent involvement to student achievement, we do not have a clear understanding of how patterns and effects of parent involvement differ across racial-ethnic and income groups" (p. 13).

J. L. Epstein et al. (2002), for example, outline six types of involvement, including improving the "school readiness" of children by providing information on homework policies, teaching parents how to help their children learn school-related skills at home, and incorporating parents as volunteers into organizations that support the school, all projected to enhance the children's school performance, regardless of family background characteristics. Along similar lines, recent legislation, such as the *No Child Left Behind Act*, conditions funding under Title I of the Elementary and Secondary Education Act (aimed at high-poverty schools) upon whether local education agencies, such as schools or school districts, comply with certain parent involvement requirements. Accordingly, schools must inform parents about their children's test scores, the schools' performances on such tests, and create capacities for increased parental participation in the functioning of the schools. A large urban school district, for instance, has responded to these requirements by establishing parent coordinators, staff members whose job it is to help encourage greater parental participation in school matters. These new staff members attend a training program on how to create parent services in the schools. In general, then, schools seem to be welcoming parental involvement (see Carey, Lewis, and Farris 1998), but schools generally maintain the power to determine what counts as participation or involvement.

D. S. Seeley (1993) refers to the approaches to parent involvement over the past 150 years as the delegation model, a view aligned with D. Olson's (2003) concept of education as bureaucratic institution, delegating the teaching to professional educators and the learning to students, without reference to parental roles in the process. From this perspective, schools remain the defining institutions, creating categories of parental participation, but mostly as supplementary or supportive to the real business of education conducted within classroom walls.

From roughly 1900–20, a period characterized by massive immigration to the United States, parent programs were educational in nature, with the in-

tention of socializing the new immigrants into this society's dominant values (Valdés 1996). With increased industrialization, fathers began to work outside the home, moving away from the self-sustenance characteristic of an agrarian society, depending instead on corporate institutions for their livelihoods (Coleman 1987). These factors, along with the establishment of compulsory school attendance, transformed education from primarily a function of the family to an obligation of the public sector.

With the growth of the institution of schooling, children were placed in the hands of strangers responsible for instilling in them societal values and mores as well as knowledge. During World War II, out of necessity, women started working outside of the home, not only as teachers but also in other sectors of the economy. J. S. Coleman (1987) and C. Ascher (1987) argue that this increased dependency on social, non-intimate, institutions correlated with less family investment in children's education.

Ascher (1987) maps three principal categories of parent involvement from the 1950s through the 1980s. In the 1950s schools mostly relegated parents to maintaining a separate role, remaining outside the school process. They were supposed to help with homework and, as directed by the school, support or facilitate teachers' and schools' roles in formally educating their children. Schools expected parents to discipline their children, to provide a moral framework, but not to interfere with the school's formal education of their children. The broadest definition of parent participation in school-directed activities included parent-teacher associations (PTA) and, later, parent-teacher conferences (but see, Siddle-Walker 1996).

In the sixties and seventies, the federal government also enacted laws that fostered dependency of the disenfranchised and the poor upon social institutions (Coleman 1987). Programs like Head Start and Job Corps enlisted parents and community members as teachers more so than the public school system. Although parent involvement in the seventies evolved into a push for parent advocacy, "neither parent participation nor community control was ever fully realized" (Ascher 1987, 3).

A trend toward parent activism also marked the sixties and seventies. In 1969, for example, the Chicano school walkout grabbed headlines in all major newspapers across the country (Acuña 2000).

Students walked out in response, in their view, to oppressive and unresponsive school policies that discriminated against them on the basis of their race, language, and ethnicity. Parents became embroiled in the conflict between the school board and the students in an attempt to satisfactorily resolve “la huelga” (the strike). Parents participated in sit-ins and sleepover protests at the school board meeting hall. Although successful, the relationship between home and school remained dichotomous and asymmetrical, and the activism was not sustained.

According to Ascher (1987), professional educators in the sixties and seventies resisted parent advisory councils created under Title I. Various factions of parents and professionals formed in opposition to one another, further diluting more effective parent participation. Schools determined what (low-income) parents needed to learn, and set up classes to teach them. During this period, schools organized parenting classes concerning discipline, nutrition, and child rearing. Despite some local control, educators remained in charge of the agenda of schooling, extending the institution’s grip on defining parent involvement.

During the conservative era of the eighties, the U.S. Department of Education reproached the education system in its report, *A Nation at Risk*, which “claimed that education failure was sufficiently acute to jeopardize the standing of the United States in the world and required urgent reforms” (Olson 2003, 13). Ascher (1987) identified the “national concern with the family and the importance of family life” (p. 4) and the criticism that teachers, by themselves, are unable to accomplish important educational goals, as factors reigniting what she calls the parent involvement movement.

This emphasis on parent involvement has continued unabated during the past two decades, as education professionals have come to acknowledge the importance of parent participation in schools. New decisionmaking roles can involve parents as members of site councils, helping to develop school improvement goals, or monitoring school activities and performance. Yet, given the institutionalization of schooling at the district and state levels and the recent implementation of sweeping federal mandates in education, schools continue to define parent participation in generally circumscribed ways. Thus, parent-teacher conferences, PTA participation, and

parent education have remained central to parent involvement efforts.

LANGUAGE, CULTURE, AND CLASS

Ethnic and racial minorities are approaching majority status in several states, primarily in the southwestern, border, and bi-coastal states and are already the majority in virtually every urban school district. The growth of English-language learners, mostly immigrant students, also motivates concern for student achievement and family involvement with schools. An important issue is whether cultural differences, often subtle but sometimes marked, represent a barrier to effective communication between teachers and parents, or to school achievement. As several researchers have warned, with little awareness about or first-hand knowledge of families’ experiences and strengths, teachers are likely to rely on popular stereotypes or misconceptions about such families and their children, or consider them passive about their children’s education (Moll and González 2004; Valdés 1996).

For example, a common perception is that low-income parents simply do not value education as much as white, middle-class parents. According to Thompson (2002), educators have often mistaken the lack of African American parents’ visible participation in school activities (p. 152), such as low attendance at school events or “a lack of parent-initiated contact [as] signs that African American parents do not care about their children’s academic success or failure” (p. 157). This myth perpetuates the struggle to achieve parent-school partnerships. Thompson indicates that African American parents may avoid the more expected participation in school-based activities, such as volunteering at school and attendance at PTA meetings, because they recall negative schooling experiences, feel unwelcome, or have been called to attend primarily when their children have difficulties in school (p. 156). In contrast, her study of African American students’ perceptions revealed that the majority of these elementary and secondary students believed their parents were significantly involved in their lives and education (pp. 154–55), and provided invisible support, such as supportive parenting, extended family networks, and “coping strategies” to deal with racism and discrimination (p. 156). In addressing the disparity between educators’ and Afri-

can American students' perceptions of parental involvement, Thompson offered the possibility that "educators are using a limited paradigm to measure parent involvement" (p. 157).

Research with Latino families also reveals a high value on education and high expectations for student achievement, but also a general unfamiliarity with the schooling process, in particular in relation to immigrant parents (Reese et al. 1995; López 2001). These parents must also struggle to dispel negative perceptions about them while trying to understand and negotiate an unfamiliar school system. Some studies have shown a difference between teachers' and parents' concepts of parent involvement (Calabrese Barton et al. 2004; Hidalgo, Siu, and Epstein 2004). As Hidalgo and colleagues point out, "Some strategies that parents employ may be missed by a parental involvement definition if the teacher does not consider the activities that parents conduct at home among family members" as involvement (p. 637). Thus, they propose "a social-contextual approach [that] uses parental knowledge, values, beliefs, and at-home practices to reconstruct the concept of family involvement" (p. 634).

TOWARD AN EQUITABLE MODEL OF PARENTAL INVOLVEMENT

J. A. González-Pienda et al. (2002) provide an interactive "structural equation" model of different forms of parent participation in schooling and its potential consequences. According to these authors, the relationship between parental involvement and academic achievement is indirect, impacting in the first instance upon a student's self-concept (pp. 261–62). The potential consequence of theorizing the relationship between parental involvement and academic achievement as mediated and multifaceted is to attribute to parents their value in educating their children while avoiding a deficit perspective, which would more directly link a lack of parental involvement, as defined by the school, with student failure. Parental involvement can be viewed as one factor in a constellation that includes "academic aptitudes," "causal attributions," and "self-concept." Studies of parental involvement are well advised to consider multiple measurements of parental involvement, for example, parents' achievement expectations, help with homework, positive reinforcement, and their

relationship to other influences upon student achievement (Gonzalez-Pienda et al. 2002).

A. Calabrese Barton et al. (2004) urge researchers and educators to view parent participation in their children's education through the lens of an ecological parent engagement model. This model reconceptualizes parent involvement as engagement within an ecosystem comprised of home, school, and community; the work integrates perspectives from cultural historical activity theory and critical race theory, and combines them with Bourdieu's concepts of space and capital. These authors consider that "parental engagement is a social practice, sustained through active participation and a dialogue in a social world" (p. 6), situated "as a relational phenomenon that relies on activity networks" where space and capital play a critical role in "the academic venue of schooling" (p. 3). Each of these elements is culturally and historically dynamic, shaping a parental engagement that mediates effective home-school relationships.

Equity, then, may lie in locating the power to define parent involvement in both parents and schools, rather than one or the other. Schools must examine their ideologies about the home language, culture, and ethnic or racial makeup of the children they teach. L. C. Moll and N. González (2004) propose a model in which teachers visit their students' households in the role of learners about the families' histories and experiences, and with a theoretical emphasis on documenting the "funds of knowledge" that characterize household life (see also, Mercado and Moll 2000). A goal of this work is to facilitate new social relations between teachers and parents that will shape perceptions of working-class and low-income households and communities as possessing experiences and knowledge that can become resources for instruction. C. Delgado-Gaitán (2004) has also proposed a model of parental participation that extends beyond simply accommodating parents to school-sanctioned structures, instead creating a social activism among parents in relation to schools to help them overcome structural barriers and advocate for their children's interests.

O. Vasquez (2003), in turn, has developed an after-school program, called *La Clase Mágica* (The Magic Classroom), based around the children's use of computers, that employs a more expansive collaborative model that extends the ecology of parental participa-

tion in their children's learning. Local community residents, especially the children's families, not only represent an additional resource for teaching, contributing their knowledge and experiences, but also help establish these settings' cultural identity by contributing to the nature and content of its routines. Parents also help to secure funding, organize parent meetings and other support networks, participate in computer activities at the site with their children, establish long-term relationships with university students and professors, and often become site coordinators. The long-term existence of such a non-school setting depends crucially on the network of support it can generate, especially from families, and how it can mediate existing constraints, especially fluctuations in funding. The involvement of parents becomes an essential strategy to help perpetuate the site within its host setting, be it a local club, library, or church.

These activities, ranging from establishing more symmetrical parental relations with teachers to cultivating parental activism in educational practice, may lead to new forms of participation in education that may help challenge, as necessary, the existing structure of schooling, especially for low-income students. It may be a matter of establishing ownership of schools, perhaps not dissimilar from middle-class parents' positioning of power in relation to schools (de Carvalho 2000; Lareau 2003). As Calabrese Barton and colleagues suggest, in advocating for their engagement perspective, it is important to understand "how parents activate nontraditional resources and leverage relationships with teachers, other parents, and community members in order to author a place of their own in schools" (p. 11).

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